Taxes and Foreign Direct Investments in the EU – do institutions matter?

An empirical analysis of effective average tax rates and foreign direct investments in the European Union

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Masteroppgave ved institutt for statsvitenskap

UNIVERSITETET I OSLO

23.5.2014

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År: 2014

Tittel: Taxes and Foreign Direct Investments in EU – do institutions matter?

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http://www.duo.uio.no

Trykk: Reprosentralen, Universitetet i Oslo

Abstract

How do national tax regimes and political institutions affect EU member states' attractiveness to foreign investors? Many scholars have researched tax regimes and FDI and political institutions and FDI, but often in isolation. In this thesis, I replicate the findings of Gropp and Kostial (2000), and expand their analysis by including important political variables. By looking at 21 EU member states over 15 years (1998-2012), I use panel data analysis to show that institutions matter for investors, and that government output and general activity is important when investors choose where to invest. In particular, the amount of motorway and infrastructure in the EU member states is an important indicator in this respect. This thesis brings two additions to the existing literature, one methodological, and one substantial.

Methodologically, I will show that model specifications in many ways determine the outcome of the analysis, and that scholars need to challenge their data in order to obtain robust results. I follow the strand of Beck and Katz (2001) by using Ordinary Least Squares (OLS) analysis with Panel-Corrected Standard Errors (PCSE). This is truly important when using short time-series, as most FDI-related analyses are, because other research methods such as Feasible Generalized Least Squares (FGLS) and regular OLS have a tendency to underestimate the standard errors and give the scholars over-confident results.

Substantially, I will show that political scientists and economists should work more together to get a better understanding of FDI, as qualitative (and quantitative) research in the social sciences can understand the political environment in a better way than many economists, and this thesis shows that political and economic variables both affect countries' attractiveness in FDI.

Preface

A long period at the University of Oslo is close to its end, and it is with wistfulness I am writing this. I have been here for 6 years, first a bachelor's degree in European studies, finishing it of with political science and comparative politics. By writing a thesis in International Political Economy, I have challenged my former knowledge in the subject, and I feel that my understanding of the political world has grown. The writing process has been bumpy and difficult at times, but I feel a sense of victory considering working full time while delivering the thesis on time.

There are a lot of people I would like to thank, but with a fear of writing a bigger preface than thesis, I will have to limit this. First of all, it is important for me to thank my supervisors, Helge Hveem and Tore Hansen, without whom I would not be able to finish the thesis. I especially want to thank Helge for providing me with French literature, so that the exchange semester in Lyon did not go without usage in my thesis. I also want to thank my girlfriend Amalie Skar for great (emotional) help and for giving me aid when times were hard. Finally, it is compulsory to thank my parents for my upbringing and intellectual conversations during Sunday dinners, and I will not forget my beloved brothers, David, Andreas, and Thomas, for challenging my thoughts all the way. I love you and hate you for that.

Kristoffer Aardal Hanssen
Oslo, 16. mai 2014

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1. INTRODUCTION

Figure 1 Apple iPhone 5S (Copyright Apple Inc.)

"Designed by Apple in California. Assembled in China." – the text on the backside of every iPhone Apple has produced. While all parts of the production chain some decades ago were usually located in the same region, todays enterprises try to increase the efficiency of every part of the production chain. One part of this is the location of their investments. In a globalized world, the physical distance between markets is of lesser importance than ever. Production costs are today at a level where a company can manufacture, assemble, sell, and provide service to, a product in all different parts of the world. These companies, the Multinational Enterprises (MNEs), have grown to be a big part of the world economy, and as a consequence, a big part of the research from students of International Business (IB) and International Political Economy (IPE).

The continued liberalization of the markets in the world in the last decades has led to an ever more integrated framework of the financial markets in the world (OECD, 2009, p. 14). In this development, Foreign Direct Investments (FDIs) has played a central role. By establishing long lasting links between countries, enterprises and economies, FDI can contribute to economic growth in both home and host countries. OECD lists many positive aspects of FDI, in particular the transfer of knowledge and technology, and the possibility for economic growth in both the home and host economy, given that the correct policy environment (OECD, 2009, p. 14). There are, of course, some negative aspects of FDI activity as well, and history has shown that

exploitation of natural resources and countries has come with the introduction of foreign investors. However, this thesis is not devoted to the ethical consequences of FDI for neither home nor host countries, but how certain policies from governments can affect the attractiveness of a potential host economy for FDI.

Figure 2 Annual inward FDI stocks in US Dollars, Current prices and current exchange rates in millions. Source: OECD statistics

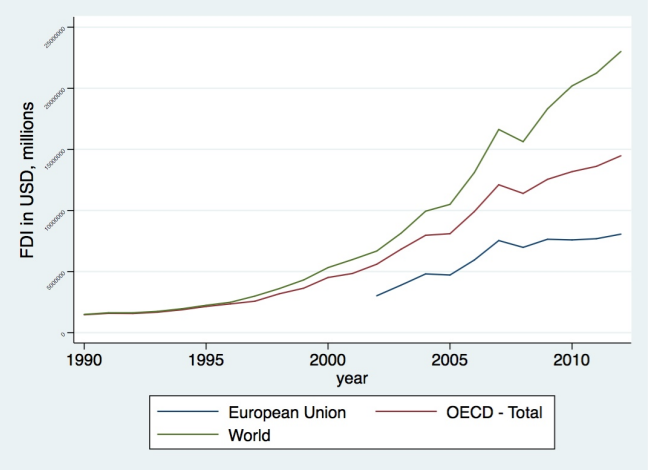


Figure 2 shows that there has been a significant growth in the level of FDI since the 1980s, in particular in the developed and developing countries. The history of FDI is, as we shall see, longer than this, but with the liberalization of the national economies in the beginning of the 1980s came a less hostile attitude towards foreign investments. Even if this hostility has grown again since the 1980's, the inwards FDI stocks keep rising. As FDI increases, the cross-border capital movement also grows. This growth reflects the multitude of enterprises and forms of FDI available. Even though the large Multinational Enterprises dominate this development, more small and medium-sized enterprises are also involved in FDI (OECD, 2009, p. 14). Growing FDI in the world economy means that this form of investment is an important factor in explaining economic growth in countries, which makes the field more interesting for scholars than ever before. Of course, there are other forms of investments contributing to economic growth in the world, with Foreign Portfolio Investment (FPI) standing in contrast to FDI, discussed later.

The determinants of FDI have been an area of research for many economists and political scientists. There are many papers focusing on institutions, natural resources, infrastructure or other factors in the intersection between politics and economy. In the recent years, there has been a discussion on the importance of a host country's tax regime (see for instance Devereux, Lockwood, & Redoano, 2008; Gropp and Kostial, 2000; Bénassy-Quéré, Fontagné and Lahrèche-Révil, 2003). Different papers draw different conclusions, but there seems to be a consensus in that corporate tax rates, to a certain degree, affect the locational decisions of foreign enterprises. Most of these analyses came in a period where the European Union discussed what the Commission labeled *harmful tax competition* (European Commission, 1997). Devereux et al, for instance, claimed that countries do in fact compete on corporate tax rates, and that this leads to a drop in the average corporate tax rate in the OECD countries included in the analysis (Devereux, Lockwood, & Redoano, 2008, pp. 1212-1213). This means that if the rate of corporate tax is important when a MNE decides whether to invest in a country, the competition between countries could be an interesting research question.

Since the outbreak of the financial crisis in 2007/2008, the question of corporate tax rates has again been at the forefront of European politics. In 2011, the French president Nicolas Sarkozy attacked the Irish taxation level, and meant that Ireland could not ask for aid from the EU whilst having the lowest level of corporate income tax in the Union (Reilly, 2011). Today, the Commission is still working on the question of harmful tax competition, for instance through the work on tax evasion and tax avoidance (European Commission, 2013a). Therefore, I want to see how national tax regimes affect the host economies' attractiveness to foreign investors. On the question of the financial crisis and how it affected the FDI, I will return to this in chapter 3.6.1, discussing how to control for an external shock.

In this thesis, I will try to explain how host countries' tax regimes can influence their attractiveness to foreign investors, and how this is affected when we include institutional quality and good governance in the analyses. To test this, I will first do a quantitative and comparative analysis of relevant and possible determinants of FDI. Gropp and Kostial (2000) looked at whether the corporate tax rates in the EU member

states influenced investments, and their conclusion was that they do. I will replicate their findings using updated data (1998-2012). Second, the methodology used in their analysis is not necessarily the best model, so I will test their data using an Ordinary Least Squares (OLS) analysis with Panel-Corrected Standard Errors (PCSE). Third, I will include political variables in the analysis, and I expect to see a reduction in the importance of the national tax regime, because *institutions matter*, at least more than most tax economists think. While it is not new to look at the relationship between taxes and FDI, or institutions and FDI, not many have looked at them at the same time.

I will, in part, base my thesis on earlier research, but I will, where possible, use data from the entire EU, as they have gone from EU15 to EU28 since the time Gropp and Kostial wrote their paper. As later chapters will show, however, data availability restricts this. The biggest difference will be the use of political variables, more than macroeconomic ones. Is it so that corporate tax rates are as important as the economists claim, or can political characteristics in EU member states give a better understanding to the phenomenon of locational decisions in FDI? I claim that the political variables in this research question are important, and that they do in fact give a better understanding of the relationship between taxes and FDI inflows when included in analyses. Since the European Union has discussed tax harmonizing in a longer perspective, these analyses become more interesting for political science than ever before. There are many political obstacles if the EU wants to harmonize national tax regimes, but primarily we should see whether the tax regimes play a role in determining whether to invest before we start the long and possibly bumpy ride of tax harmonizing in the EU.

My research question is:

What role does host country taxation regimes play in EU member states when attracting foreign direct investments?

But why is this important? There are many research papers already concluding that corporate tax rates matters, and that lowering the tax wedge in most cases will increase

the inflows of FDI. I have reason to believe that institutional quality matters more than earlier research claim, and if that is true, it may have big consequences for the policies implemented in the European countries. Also, some scholars have found empirical evidence that FDI is more sensitive to institutional quality than domestic investments (Aizenman & Spiegel, 2002). If it is so that high institutional quality and good governance can compete with low tax rates, there are some EU member states that ought to revise their policy reforms, as we indeed have seen a race towards the bottom in corporate tax rates over the last decades (see Appendix for statistics).

In the following chapters, I will present hypotheses connected to this research question that I will test empirically through a panel data analysis. The role of this thesis is to try to give a different perspective to the research on the relationship between national tax regimes and FDI, especially through including political variables in the analyses, and feasibly give a new and better understanding of the tax regimes in the member states in the European Union. In the first part of the thesis, I will define the Multinational Enterprise, Foreign Direct Investment and the MNEs motivations for FDI. The resource-seeking, market-seeking, efficiency-seeking or asset-seeking motivations have played different roles over the years and between countries, and play a significant role in the understanding of why enterprises choose to involve themselves in FDI. I will give a resume of the discussions of corporate taxation in the EU and whether we can see a race for inward FDI in the Union. Before I discuss my theories and variables for the regression analyses, I will give an overview of earlier research on this subject in the end of this chapter. In chapter 3, I will elaborate on the methodology used in this thesis, the design, units and variables. I will describe the challenges and obstacles using panel data analysis, and give an explanation to why I choose to measure these phenomena as I do. Chapter 4 starts with the panel analysis, where I first replicate the analysis by Gropp and Kostial, before I expand the baseline model with political variables of relevance. I will run different tests with various indicators and model specifications as a test of robustness. In chapter 5 I will analyze the findings from chapter 4 and elaborate on the difficulties in the data, as well as giving some recommendations for the future, before I give my concluding remarks in chapter 6.

1.1. The Multinational Enterprise

The global level of outward FDI was in 2012 $1.35 trillion, and UNCTAD expects the number to be the same in 2013 (UNCTAD, 2013, p. ix). Even though this was a drop from 2011, the level of FDI in the world is of enormous proportions. How did the foreign direct investments become such a central part of international business? In this part of the thesis, I will attempt to draw an outline over the history of the MNE and FDI. The history briefly is that of a wish for entities to occupy production and transactions outside of their home country (Dunning & Lundan, 2008, p. 145).

Already in 1914, FDI amounted to 9% of the world output, or about 15-18 billion US dollars; a level FDI did not reach in the world economy again until the 1990s, but since 1980, FDI has outstripped the growth in world GDP and world exports (Dunning & Lundan, 2008, pp. 19,189). In 1980, a few, large and developed countries dominated the international scene: twelve countries accounted for 94% of the total stock of outward direct investment, and of these 94%, the US, the UK, West Germany and Netherlands controlled 73% (Dunning & Lundan, 2008, p. 23). 32 years later, the same four countries accounted for 40%. (UNCTAD, 2013, p. 217) The increasing activity of smaller and medium sized economies is noticeable, and the relative importance of the US economy is declining. From the 1970s onwards, more MNEs in the developing world emerged, and this happened at the same time as new competitive advantages encouraged foreign production (Dunning & Lundan, 2008, p. 28).

The Multinational Enterprise consists of the word *multinational*[1] and *enterprise*[2]. The former would demand that the enterprise has to control value-added activities in more than one country. OECD defines the enterprise as "an institutional unit engaged in production" (OECD, 2009, p. 44). This includes corporations, non-profit corporations and unincorporated enterprises. Whereas the OECD speaks about Multinational enterprises, the UN uses *transnational corporation* for the same organizational form (UNCTAD, 2013). I will in this thesis use the phrase Multinational Enterprise (MNE).

[1] I will use the term multinational throughout the thesis. In the literature, the term transnational is also used to describe the same phenomenon.
[2] I will use the term enterprise throughout the thesis, in the same meaning as a corporation, a firm or a company.

There are many working definitions of the MNE. One could define it as an enterprise engaging in FDI (Dunning & Lundan, 2008, p. 3). The MNE distinguishes itself from the other forms of organizations (like the international trading firm or the domestic multi-activity or diversified firm), in that it engages in cross-border production *and* transactions, whereas the other forms of firms only engages themselves in one of them (Dunning & Lundan, 2008, p. 6). The question of control over the foreign enterprise is central (Hymer, 1976, p. 1). Usually, one divides between portfolio investment and FDI, in that the former is only engaged in the transfer of financial capital, whereas the latter is involved in many, if not all, of the value-adding activities, as production, manufacturing, technology, cultural norms and other distinct features of a foreign country. In addition, there is the degree of power over the investment object – as FDI requires a minimum of 10% ownership from the investor (Dunning & Lundan, 2008, p. 7; OECD, 2009, p. 23). It is not an easy divide between these forms of investments, and the dividing line is bound to be arbitrary. An investor may own more than 10% without being able to exercise control over the investment, and another investor may own less than 10% and exercise control. A good example of the latter is the Norwegian sovereign Pension Fund, which banned the American grocery store Wal-Mart because of bad ethics in the American company (Landler, 2007). Even though the fund owned less than 10%, the fund is such a large investor in the global finance business that the decision made the Wal-Mart stock to drop, and the company to change their labor policies. Nevertheless, the divide is important for the analysis of FDI activity, as the form of ownership may impose consequences for the importance of the corporate tax rates in the investment made by the enterprise.

I have briefly touched upon the MNE's motivations for engaging in FDI. According to the existing literature, they can be resource-, market-, efficiency-, or asset seeking (Dunning & Lundan, 2008, p. 68). Historically, enterprises have invested in foreign countries first motivated by the availability of natural resources. As this is in place, other motivations arise. By understanding how the MNE behaves and what motivates it to invest, we can get a better understanding of why the MNEs invest in certain countries. This is outlined in chapter 2.1.

I will use OECD's benchmark definition of FDI, which is in line with the work of UNCTAD. OECD has developed this strict definition to make the statistics more reliable, which is important when you compare the level of FDI, as I will in my analyses. "A category of cross-border investment made by a resident entity in one economy (the *direct investor*) with the objective of establishing a lasting interest in an enterprise (the *direct investment enterprise*) that is resident in an economy other than that of the direct investor" (OECD, 2009, p. 22). In this definition, it becomes clear that the enterprise involves itself in value-adding activities in a country different from itself, which explains rather simply the *foreign* in FDI. The *direct* element is the objective of establishing influence over the direct investment enterprise, while the *investment* is the establishment of a lasting interest in an enterprise. The degree of influence and control of the investor in the investee is what makes the FDI different from other forms of investment, like the portfolio investment.

There have been many attempts to create a threshold definition for when an enterprise goes from an ordinary enterprise to a multinational or transnational enterprise. I define it in line with the work of the United Nations Conference of Trade and Development (UNCTAD). In their Transnationality Index (TNI), they rank the largest corporations in the world by using an index as a measure of foreign assets, sales and employment (UNCTAD, 2013). In short, this means that the index measures the relationship between domestic and foreign investments made by any enterprise. A high score on the TNI means that the enterprise has a large proportion of its investments abroad, while a low score on the TNI means that the enterprise has a bigger part of its investments at home. UNCTAD presents data on nation-level, but the TNI-index deals with enterprises. Considering that I will use data on nation-level and not corporation-level, I will not use the TNI index in my analysis. However, when looking at some countries in a case study, the TNI index is interesting as it can give insights to what enterprises are present in a country and how transnational that enterprise is. A large MNE present in a small EU member state may have big consequences for the annual inflow of FDI in that country.

When working with MNEs and FDI, it is important that the numbers are comparable. To mend the differences in methodology used in the different member states, the OECD has developed a benchmark definition of FDI. The work started in 1983 with the first edition of the "Benchmark Definition of Foreign Direct Investment", which tried to establish a set of rules to improve the statistical measures of FDI (OECD, 2009, p. 14). The benchmark definition is now in its fourth edition, revised because of globalization and evolving enterprises. The main objective of the benchmark definition is to make a single point of reference in the usage of FDI statistics (OECD, 2009, p. 15). They apply a numerical criterion, stating that FDI only takes place if the direct investor owns at least 10 % of the voting power of the enterprise (OECD, 2009, p. 23). This criterion defines when an investor exercises some degree control over another enterprise, which is one of the demands for FDI to take place. As Dunning and Lundan points out, there is no international consensus for the correct level of voting power demanded to have an "effective" degree of influence on the management of an enterprise, and you will find variation in this demand from 10 to 25 % in the majority of countries (Dunning & Lundan, 2008, p. 7). The enterprise is a subsidiary to the direct investor if the investor owns more than 50 % of the voting power in an enterprise. If, however, the investor owns more than 10%, but less than 50%, of a company, the enterprise is an associate to the direct investor (OECD, 2009, p. 53).

1.2. Corporate taxation and the European Union

Taxation policy is, and has always been, an important area of national control for the EU member states, so the regulation of taxes is placed outside of the community method and the EU treaties. As with many other areas outside of EU decision-making policy, however, there has been attempts on harmonizing and regulating some areas of taxation policy, for instance in the Taxation Policy Group or through the work of the Tax Package (Cattoir, 2006). A good example of the difficulties regarding tax policy in the EU is that the Parent/Subsidiary and Merger Directives of 1990 took no less than 30 years of negotiations to adopt (Cattoir, 2006, p. 2). These were the first directives concerning business taxation in the European Union. The Tax Package of 2004 started as a communiqué from the European Commission in 1997, discussed heavily in the Council between 1997 and 2004, before adoption. In this package came the *code of conduct for business taxation*. Large differences in taxation policies in the EU member states sparked the discussions. There was a need for a more harmonious system in the Union, as a continued disharmony would be harmful, both for the internal market and the employment (Cattoir, 2006, p. 2). This is related to earlier research, where government income losses from reduced corporate tax revenues makes governments raise taxes on less mobile (and more predictable) areas like labor taxes, which reduces the overall competiveness of the European Union. It seemed as if the discussion had to take place in the EU system, as no member state would be willing to risk lower tax revenue without knowing that other member states followed in the same order. An interesting side note would be that the EU Commissioner initiating the discussions on tax policy was Mario Monti, who later became prime minister of Italy after the financial crisis.

The Code of Conduct for Business Taxation is to tackle the measures that in a harmful way could affect the localization of business in the EU (Cattoir, 2006, p. 3). Even if the Code of Conduct did not clearly define the threshold for when a tax becomes harmful, it was clear that corporate taxation levels deviating from the other member states' levels was at least potentially harmful. Examples of these in total 66 (!) measures are reduced tax rates/bases, group financing, insurances, holding of shares

and so on (Cattoir, 2006, p. 6). After adoption, the Code of Conduct group started their work of dismantling harmful tax arrangements, and the results started to come already by 2003 and 2004 (Cattoir, 2006, p. 6). In addition, in the Eastern Enlargement, the Code of Conduct helped the candidate countries roll back many potentially harmful measures upon entry.

In addition to the work on harmful taxes, transfer pricing has also been worked on from the Commission's side. Transfer pricing involves the transactions *within* an MNE, and can be truly problematic when working with an internal and fair market as the EU single market is supposed to be. "Since the prices are set by non independent associates within the multi-national, it may be the prices do not reflect an independent market price" (Commission, 2014). This is problematic as the tax bases in the different countries are not necessarily the same, as different rules are present in the EU member states. This is something that I cannot control for in my thesis, as the issue is too large to be included, and it demands a lot of data that is not necessarily publicly available. The Commission has worked on this through the *Joint Transfer Pricing Forum* and the Commission working paper *Company Taxation in the internal market*, but they also showed the difficulties to measure and control transfer pricing in a satisfying way (European Commission, 2001, p. 7). As such, I will include a section on transfer pricing in chapter 5.

The area of corporate taxation is still on the Commission's agenda, as it has proposed amendments to the corporate tax legislation to reduce the risk of tax avoidance (European Commission, 2013a). With the increased interest in the business taxation in the EU, came also the research on the impact of national taxation regimes on the locational decisions of MNEs in the EU. In the following paragraphs, I will give an overview of the findings in these analyses, before I look at the theories and variables in my own thesis in chapter 2. First, I want to discuss whether we can see a race for inward FDI in the EU, basing the next sub chapter to a large degree on the book by Lars Oxelheim and Pervez Ghauri, *European Union and the Race for Foreign Direct Investment*.

1.3. FDI IN THE EUROPEAN UNION: A RACE?

The tax policy in the European Union has two components; the first is the direct taxation, where the member states has full sovereignty and the possibility to change their tax policies as they choose; the second is indirect taxation, where the European Union has taken measures because indirect taxation affects the free movement of goods and services (European Commission, 2013b). However, the Commission works with harmonization and common framework to avoid tax evasion, double taxation and other forms of distortions of competition. Also, the Amsterdam treaty created rules against unfair competition in the competition law, but also in other laws preventing market dominance (article 102) and state aid (article 107), most recently updated through the Lisbon treaty (European Union, 2007).

Even though the history of FDI is a long one, it was not until the 1980s that the expansions of direct investments abroad truly started, at least in terms of volume. The trade liberalization of this decade was a game changer, and the removal of capital controls played an important part in this process. More and more countries realized the difficulties combining capital control with an optimal resource allocation and economic growth, goals seen as important in "the decade of deregulations" (Oxelheim & Ghauri, 2004, p. 4). The increasing regionalization and the skills and knowledge in the MNEs lead to a positive relationship between the investors and the countries, and supranational entities like the EU played an important role as a supervisor. Since then, the EU member states have implemented several policies recommended by the Commission to raise the competitiveness of the Union. The member states have implemented these forms of policies and welcomed FDI in their economy because of the positive effects FDI may have, as a spillover of technology, job creation, capital flows and an increase in production capacity (Oxelheim & Ghauri, 2004, p. 9). From a EU perspective, it was important to raise the competitiveness of the EU markets compared to the rest of the world, but at the same time makes sure that the intra-market competition was fair and unbiased. To manage this demanded a modus operandi characterized by caution.

Growing unemployment was a challenge in many EU member states in the beginning of the 1990s. Attracting FDI was a good way of creating jobs, and the member states went far in the attempt of out-competing each other (Oxelheim & Ghauri, 2004, p. 14). Over time, and perhaps because of unfair competition, there was an increase in regulatory policies at the national level, but the level of FDI activity was still growing. Even though the EU is a monetary union with harmonized policies in many areas, there are still incentives the member states can use to attract FDI. One of these is the corporate tax rate. There are also the possibilities of incentives directed at particular enterprises, but that is a too complicated area of research for this thesis (Oxelheim & Ghauri, 2004, p. 15).

As the level of FDI in the EU grows, so does the competition between the member states to attract the MNEs. Most of the member states have investment promotion agencies working actively to attract foreign investments, and the EU tried to remedy this competition by adopting the code of conduct in 1997. This was a way of securing fair competition between the member states and make sure that potentially harmful tax measures would not take place (Oxelheim & Ghauri, 2004, p. 19). It is important to point out that only specific tax measures are subject to these rules, and that any member state is free to reduce their general taxes, as long as they do not only benefit MNEs et cetera. The competition between countries still exists, and the introduction of the Euro has made it even more active, as some countries have lost the exchange rate advantage they had before the Euro came into place. It is important to remember that even though there is competition between the countries, the EU represents a *region* of interest, as the MNEs gain access to the internal market no matter what country they establish themselves in.

There are also policies from the EU that has promoted FDI, and empirical analyses has shown that both the Agenda 2000 (Breuss, Egger, & Pfaffermayr, 2001) and the EU social cohesion policy (Basile, Castellani, & Zanfei, 2008) amongst others, have played an important role in the direction and development of FDI in the EU member states. In particular, the Structural and Cohesion funds have shown to attract foreign investments in the member states by providing more favorable conditions for the investors (Basile, Castellani, & Zanfei, 2008, p. 337).

The competition between the EU member states can be placed in five different elements, defined by Oxelheim and Ghauri (2004, p. 16). These elements add some perspective to the reasoning behind FDI. They are important as a historical backdrop, and they form a basis for discussion later in the thesis.

The first element relates to advantages in information and agglomeration support. These forms of incentives are difficult to measure, but are of high importance, for instance how the UK has some advantages related to language in relation to US FDI (Oxelheim & Ghauri, 2004, p. 21). Other examples are education, level of bureaucracy or strategies directed at specific sectors leading to for instance clusters. The latter effect may be so large that the corporate tax rate will not play any significant role for the locational decision of the MNE (Oxelheim & Ghauri, 2004, p. 22), and this element is related to good governance, central in this thesis.

The second element relates to different forms of subsidies. Oxelheim and Ghauri focus on grants, tax concessions, soft loans, equity participation and warranties (Oxelheim & Ghauri, 2004, pp. 23-24). Grants dominated in the 1980s and 1990s, but EU harmonization has reduced their importance. Tax concessions are of course central in this thesis. However, the authors also look at sector-specific tax concessions, a mean used in particular by Germany (Oxelheim & Ghauri, 2004, p. 26). Soft loans are loans given by the governments with a lower rate than the market can offer, often given in the start-up phase for the enterprises. Finally, the equity participation “involves

subsidy to the extent that the rate of return demanded by the government falls below that demanded by private capital markets" (Oxelheim & Ghauri, 2004, p. 27).

The third element, a looser interpretation of international agreements from the host government, is a more controversial issue. Social dumping (lowering the labor-related demands) and lowering the environmental demands towards the MNEs are examples of this (Oxelheim & Ghauri, 2004, p. 28). Whilst the former only has scarce evidence, the enlargements of 2004 and 2007 showed some effects for the latter. However, one could question whether this is a consequence of intentional policies, it may be more probable that investing corporations choose countries that are less occupied by compliance with international agreements, as we have seen with complaints on Ryanair and Norwegian in the air transport sector.

Cyclical and geographical factors represent the fourth element of competition available for the EU member states. Good infrastructure may be the best example, but geographical location can also be of big importance for an enterprise looking for a particular market (Oxelheim & Ghauri, 2004, p. 28). The final element relates to nationalism and home country-biased customers. This means has not been used a lot in the EU, but some elements can be seen in the more nationalistic countries, in particular the Eastern European countries before entering the Union (Oxelheim & Ghauri, 2004, p. 29). This is a problematic statement, however, as home country-biased customers can hardly be regulated. Also, one could question whether cyclical and geographical factors can be placed in the same category. Cyclical factors as exogenous shocks, economic up- or downturns represent a different form of competition than geographical factors as natural resources, common languages or infrastructure.

1.4. EARLIER RESEARCH

The importance of the host country's corporate tax rate is not a new discussion, and the results of the research done on the field have not been consistent. While Gropp and Kostial (2000) found an effect, Devereux and Griffith (2002) did not find a determining effect. There are many challenges connected to the analyses of corporate tax rates. It is not an easy process to measure the corporate tax rate in a correct matter, and there is a large discussion in the literature on what measures to use. In addition, national tax regimes differ from one another. For instance, a country may have a low corporate tax rate, but a high dividend tax that may nullify the effect the low corporate tax rate may give an investor. A third challenge is that many enterprises may accept high corporate tax rates if the taxes are in some way connected to better infrastructure or public services. A fourth challenge is that tax competition between countries can be too expensive because of agglomeration forces, which one prevents by a large difference in tax rates (Basile, Castellani, & Zanfei, 2003, p. 15). Economists, often overlooking important political factors like stability, inequality or industrial conflicts, are responsible for most of the existing literature on the relationship between corporate tax rates and FDI.

1.4.1. GROPP AND KOSTIAL (2000)

The paper by Reint Gropp and Kristina Kostial analyzed the connection between corporate tax rates, FDI, and corporate tax revenues. In short, their analysis found significant results indicating that national tax regimes indeed affect FDI inflows, and that the FDI flows affect the corporate tax base (Gropp & Kostial, 2000, p. 5). They also simulated tax rate harmonization on EU-level, but that is less relevant for the scope of this thesis. They argued that non-tax factors contaminated earlier research on this field, i.e. that they could not isolate the tax effects (Gropp & Kostial, 2000, p. 8). They included the growth forecast indicator of the IMF as an indicator of a country's expected growth; an indicator of expected real exchange rate depreciation (relative to that of the US), an openness indicator (share of trade in GDP), and finally, they included the total FDI flows into a country as an indicator (Gropp & Kostial, 2000, p. 16). In their econometric analysis, they found that "[…] the statutory tax rate is

estimated to be significantly negatively (positively) related to FDI inflows (outflows" (Gropp & Kostial, 2000, p. 17). Moreover, "[…] overall, we find strong evidence in favor of the notion that taxes play an important role for the magnitude of FDI in and outflows. Taxes appear to be an important aspect when firms consider whether or not to invest abroad" (Gropp & Kostial, 2000, p. 19). As we shall see in chapter 3, the Feasible Generalized Least Squares analysis with Random Effects, as they used, is not necessarily the best linear unbiased estimator (BLUE). Therefore, I will replicate their findings using an OLS PCSE-model, which I elaborate in the methodology chapter.

1.4.2. De Santis, Mercuri and Vicarelli (2001)

The paper by Roberta De Santis, Maria Cristina Mercuri and Claudio Vicarelli analyzes the impact of fiscal variables in the location choices within the EU. In short, their analysis found that the total fiscal wedge on labor had a bigger impact than the corporate tax rates on FDI inflows in the EU member states (De Santis, Mercuri, & Vicarelli, 2001, p. 2). This means that the enterprises consider the taxes in general, more than the corporate tax rate in particular. They also find that a country with a high corporate tax rate might generate a higher level of FDI by lowering the taxation rate quite modestly. The authors point out that the corporate tax rate alone does not take into account all the aspects of taxation an enterprise meets, for instance loss apportionment, interest detaxation or capital allowance and amortization (De Santis, Mercuri, & Vicarelli, 2001, p. 11). They included variables representing macroeconomics (per capita GDP, GDP, exchange rate volatility, degree of market openness), environmental conditions (infrastructure, technological innovation) and fiscal determinants (tax burden, tax wedge on labor and corporate tax rate) (De Santis, Mercuri, & Vicarelli, 2001, pp. 18-19). All the variables included in the analysis turned out to be significant, but that the tax wedge on labor is of more importance than the corporate tax rates (De Santis, Mercuri, & Vicarelli, 2001, p. 25).

1.4.3. BÉNASSY-QUÉRÉ, FONTAGNÉ, AND LAHRÈCHE-RÉVIL, (2003)

The authors of this paper tested the sensitiveness of FDI to tax differentials across countries. They found that a relatively high level of corporate taxes discourages FDI inflows, but that a low level of corporate tax rates does not significantly attract FDI (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003). This means that lowering your corporate tax rates to match the lowest rates in the EU does not necessarily give you a big increase in FDI, but that having the highest tax rates in no way will benefit your inflows. By using a panel analysis consisting of bilateral FDI flow data from 1984-2000, they showed that tax differentials matter. In addition, the research showed that the FDI inflow reaction to tax differentials is not linear; instead, it depends on the size and sign of the tax gap, in addition to bilateral tax schemes (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003, p. 8). They measure this with a statutory tax differential, an average effective tax differential, a marginal effective tax differential and an apparent effective tax differential, all of which have a significant effect (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003, p. 19). There is a discussion in the literature of what measure to use when researching tax policy consequences, and this is something I will discuss in chapter 3. They also used the gravity variables (size and physical distance between two countries), relative unit labor costs, public expenses, market potential, and common language. By testing for the impact of tax schemes, they find that "the semi-elasticities to tax differentials are significant for both credit and exemption countries" (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003, p. 20). Large tax discrepancies are more important than narrow tax differentials, in that the former produces more FDI outflows (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003, p. 26).

2. THEORIES

Because there are many motivating factors leading to FDI, it is difficult to perceive a complete theory of the determinants of FDI. Therefore, I will present John Dunning's Eclectic Paradigm (OLI-paradigm) as a general understanding, before I dive into more the location-specific determinants. Even though the entire OLI-paradigm is interesting for the analysis of MNE activity, I will especially look at the locational factors, as my research question relates to this, before I continue with theory on tax competition and institutions/good governance. I will to a large degree base the first part of the chapter on the book written by John Dunning and Sarianna Lundan in 2008, *Multinational Enterprises and the Global Economy*. The book draws on Dunning's earlier work and gives a good analysis of the paradigm. It is important to remember that the OLI-paradigm has been an area of dynamic change over time, so even if it still resembles the original article from 1976 and further the article from 1980, "*Toward an eclectic theory of international production: some empirical tests*", the paradigm has evolved since then. I agree with the criticism from Dunning's apprentice Rajneesh Narula, in that the constant development of the eclectic paradigm has made the paradigm cumbersome, and that the basic OLI-paradigm, or the "EP-lite", as Narula calls it, gives the best foundation for discussion (Narula, 2010, p. 39).

2.1. The Eclectic Paradigm

John Dunning developed his Eclectic Paradigm as a general framework for the analysis of the activities of the MNE. Even though it is not a theory in the pure sense of the word, the paradigm offers explanations for the actions MNEs perform on foreign soil (Dunning & Lundan, 2008, p. 95). There are many external factors playing a part in this as well, for instance the ties between home and host countries, the type of products produced, or business strategies (Dunning & Lundan, 2008, p. 103). In short, the paradigm postulates ownership-, location-, and internalization specific factors that explain why or when a MNE decides to get involved in FDI. The paradigm is meant to explain all forms of foreign production through the conditions elaborated for in the following paragraphs (Dunning & Lundan, 2008, p. 100).

The level and structure of the MNE's value-adding activities abroad depends on four conditions (Dunning & Lundan, 2008, p. 99). The first condition is whether the MNE has some ownership-specific advantages (O) relative to other enterprises in the search for new markets. To a large degree, these take the form of intangible assets (Dunning & Lundan, 2008, p. 99). Using these O advantages in a good way may lead to a wealth-increase for the enterprise. The second condition is the market internalization (I). If the first condition is met, the enterprise has to decide whether to add value to the O advantages (the alternative is to sell them to others). The I-advantages are usually related to a strong organization or an "ability to exercise monopoly power over the assets under their governance" (Dunning & Lundan, 2008, p. 100). The third condition relates to the location-specific advantages (L). If the two first two conditions are met, the decision to invest hinges upon the degree to which the enterprise believes that using the O advantages in the foreign country is in the enterprise's best interests. Since the L advantages are located in a country, they take different shapes in different businesses. The final condition is whether, given the three advantages (OLI) of the enterprise, the investment is in line with the long-term objectives of the enterprise (Dunning & Lundan, 2008, p. 100).

Summarizing, the paradigm predicts that the more O advantages an enterprise has relative to other enterprises, the more of an incentive the enterprise has to internalize (I) these advantages, and finally, the more the enterprise is willing to use these O and I advantages in a foreign country (L), the higher the probability to engage in FDI in a foreign country.

The O advantages of an enterprise relative to others can be split into three parts, to easier understand what general kinds of advantages we are discussing: property rights and/or intangible asset advantages (Oa), advantages of common governance (Ot), and institutional assets (Oi) (Dunning & Lundan, 2008, p. 101). The resource structure of the enterprise determines the Oa. Examples of these are innovations, management, experience or other intangible assets. The advantages of common governance (Ot) are advantages branches enjoy relative to their competitors in being part of a bigger enterprise, for instance access to product markets, economies of scope and scale, etc. The institutional assets (Oi) are "the formal and informal institutions that govern the value-added processes within the firm and between the firm and its stakeholders" (Dunning & Lundan, 2008, p. 101). This can be different forms of norms, codes of conduct, incentive systems, etc. Examples of L advantages can be labor force, access to raw materials, infrastructure, import controls or other factors that differ between countries. These may also be of legal character (Dunning & Lundan, 2008, p. 102). The L advantages are truly interesting for this thesis, as the institutions and good governance is a part of this. The I-advantages are among others to avoid negotiation costs or broken contracts, to control supplies or market outlets, or to engage in cross-subsidization or transfer pricing (Dunning & Lundan, 2008, p. 102).

Location-specific advantages

Dunning makes additional divisions of the L advantages, depending on whether the enterprise is resource-, market-, efficiency-, or asset seeking, and each form of international production has its own characteristics. There is also a significant difference in L advantages between countries and those between industries or firms (Dunning & Lundan, 2008, pp. 104-107). Whereas the L advantages for the resource-

seeker might be possession of natural resources, infrastructure or taxes, the market-seeker is more interested in labor costs, market size or government policies as tolls or other barriers of trade. The efficiency-seeker prioritizes economies of product specialization or low labor costs, whilst the asset-seeker might consider locations that give technological or organizational improvements for the enterprise (Dunning & Lundan, 2008, p. 105). Globalization has made the concept of location more difficult, as enterprises can affect countries through their activities, even outside the countries they invest in, and the products sold are not necessarily physical products, as was common a few decades ago (Cantwell & Narula, 2001, p. 19).

There are important differences in priorities between countries, industries and firms. For country-specific circumstances, the physical and institutional distance between the home and host country is of importance. The tariffs, taxes, investment aid and other macroeconomic factors are also relevant, in addition to the availability of clusters (Dunning & Lundan, 2008, p. 106). In industry-specific circumstances, the transport costs are more relevant, in addition to industry-specific barriers, the competition between the already existing enterprises in the industry, or tax incentives. For the firm-specific circumstances, management strategies, experience in foreign involvement, culture, attitudes to risk diversification and other factors are more relevant (Dunning & Lundan, 2008, p. 106). The country-specific circumstances are most relevant for this, as my preliminary analysis will examine how the country's tax regime affects onward flow of FDI to the country. Also, there is dynamism between some ownership-specific and locational advantages, and the interaction between them is increasing (Cantwell & Narula, 2001, p. 7). In particular, technological advances in certain enterprises are often specific to regions or nations, and it is therefore important for other enterprises to be on site in order to follow such technological advances, leading to clusters of similar enterprises in the same areas.

The value of institutions has been of more interests to the scholars of FDI in recent years. You could argue that the quality of institutions is playing a bigger and more important role than ever, especially considering how O advantages today are more easily transferable between countries than before (Dunning & Lundan, 2008, p. 138). The OLI paradigm did not incorporate the growing literature of institutions in its original version, but in the second edition of Dunning and Lundan's book, a section was included on how institutional quality affected the ability to attract FDI, and also how they can affect how the MNEs think when deciding to invest (Dunning & Lundan, 2008, pp. 308-309). Whether this is relevant to the EU is something this thesis will look more into in chapter 2.3, but it is interesting to see that authors like Rodrik et al. (2002) conclude that the quality of institutions is more important than economic integration and geography, even though they have an indirect effect through the quality of institutions (Rodrik, Subramanian, & Trebbi, 2004). I would expect that the institutional changes in the Central and Eastern European countries following the end of the Cold War and process leading up to the eastern enlargements of 2004 and 2007 (and also Croatia in 2013), played a significant part in the increasing attractiveness of investing in these countries.

TABLE 1 LOCATIONAL DETERMINANTS (DUNNING J., 1980)

Type of international production	Location advantages
Resource-based	Possession of resources
Import substituting manufacturing	Material and labor costs, markets, government policy
Export platform manufacturing	Low labor costs, incentives by host economies
Trade and distribution	Local markets, proximity to the local costumers, local adaptation
Ancillary services	Markets
Miscellaneous	Markets

2.2. TAX COMPETITION

Most theories of tax competition claim that a state's primary economic goal is to offer public services. Taxes finance these public services, and to raise profits, the countries attract investment to maximize the net value added in a country (Wilson, 1999, p. 271). However, to attract inward investments, the corporate tax rates must be kept at as low as possible a level, given the level of public goods. This is where the competitive element arrives (Wilson, 1999, p. 272). There have been many models built upon this theoretical framework, and we can start with a baseline model. The basic assumption of the theory of tax competition is that countries delve into a wasteful competition in the attempt to attract investments through tax reductions (Genschel & Schwarz, 2011, p. 339), and that the countries enter a "race to the bottom".

Within each of the 28 member states in the EU[3], there are enterprises producing some form of output. For the simplicity of the model, you can say that each enterprise produces a single output, based on two production factors: mobile capital and immobile labor (Wilson, 1999, p. 273). Consumers buy the products as consumption goods, while the government buys the products as an "[…] intermediate good, which it then transforms into a public good". (Wilson, 1999, p. 273). We can explain this using a utility function, U (C, G) where C represents private consumption and G is the consumption of public goods. The consumer with wage and other income finances C. Importantly, the model assumes that taxes on capital finance the supply of public goods in the country (Wilson, 1999, p. 273).[4] Corporate taxes are rarely a large portion of a state's income, however, so the assumption may be exaggerated (see table 17 in appendix). A challenge for the countries is to find the optimal tax rates, those that maximize the utility function, U, mentioned above. In this theoretical framework with competition between two countries, Wilson emphasizes how raising taxes in country *a* leads to an increase in revenue in country *b* because of the outflow in country *a*. This happens because countries are only concerned with maximizing the welfare of their

[3] Wilson use "regions" instead of countries, as the model may be used for cities, states, provinces or countries (Wilson, 1999, 2003). For any purpose of this thesis, I will use the term country.
[4] So does taxes on personal income as well, something Wilson does not look at.

citizens (Wilson, 1999, p. 275). In the race to attract foreign investments and capital, countries set their tax rates at a suboptimal low level. We might expect a different result in the EU, as this theoretical perspective assumes the same tax rate in every country (region), although it might explain why the European Commission is working with this subject on a EU level.

Taxation of cross-border flows usually follows one of two approaches: the *source/origin principle* or *the residence/destination principle* (Genschel & Schwarz, 2011, p. 343). Following the source/origin principle, the country taxing is the country where the investment takes place. However, following the residence/destination principle, the country taxing is the home of the investor. In corporate taxation, countries often tax the profits from both domestic and foreign activity, and as you would expect, the source/origin principle is the general principle followed (Genschel & Schwarz, 2011, p. 346). As MNEs will strive to maximize profits, they may arbitrage in two ways – either by shifting the book profits to a low-tax country (transfer pricing), or by moving the activities generating profit there (Genschel & Schwarz, 2011, p. 346). The former is more interesting for this thesis, as it involves transfer pricing, which is a subject I will return more to in the conclusions of the paper. The latter includes the possibility that business is transferred to tax havens; this is not dealt with here in my thesis.

The theory on tax competition predicts a race to the bottom and a suboptimal tax rate in the international competition between countries. This could be an argument for better harmonization on corporate tax rates in the EU. But, as Bénassy-Quéré et al claim: *"(...) the fear of tax competition is justified only if (i) mobile bases do respond to tax cuts through relocation, (ii) tax cuts produce a loss in fiscal receipts at least in some countries, and (iii) this revenue loss needs to be compensated for by a welfare-decreasing tax increase on other, less mobile bases, likely (non-qualified) labor."* (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003).

2.3. DO INSTITUTIONS MATTER?

The discussions on the importance of political institutions and good governance for economic growth have escalated the last decades. There is a consensus that the quality of government, and good governance, is essential for austerity in a country, however inconclusive the definition of government quality may be. In general, governance involves political institutions, state capacity and the regulation of economic institutions (Acemoglu, 2008). An example of this is how different the economic development has been in the countries of South Korea and North Korea. People of similar origin, highly contrasting political systems, and seeing how the democratic state of South Korea, by far, outperforming the communist North Korea. The literature emphasizes the broad definition of institutions, but struggle to find what aspects of institutions are most important (Acemoglu, 2008, p. 2). Most scholars emphasize a non-intervening state (low taxes, high property rights), but there are several cases where an intervening state may experience economic growth over time (the Nordic countries in particular). However, there is a causal relationship between institutions and prosperity and growth, in how poor countries, when strengthening their property rights, raise their productiveness (Rodrik, 2004, p. 1). I choose to define good governance in economic terms, so that good governance and good political institutions facilitate economic growth and foreign investments in the country, in line with Fatica (2010), La Porta et al. (1999), and Daude and Stein (2007). This means that a government that is perceived as good by the inhabitants, but that does not facilitate economic growth and foreign investment, will not be regarded as *good* in my definition, but this is a common definition in the literature.

The empirical literature on the quality of political institutions and how this affects inflows of FDI has also grown, but is still rather scarce – at least amongst the tax economists. However, the topic of whether higher or lower taxes are best for economic growth (intervention versus non-intervention) has been discussed for a long time, and the results are ambiguous (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1999, p. 225). In some cases, low taxes promote trade, but in other cases, high taxes are spent on important goods, which makes investment more interesting. Because of the

pressure put on governments to reduce corruption and to correct distorted incentives in the market, the public services are often overlooked (Acemoglu, 2008, p. 6). Many scholars have been interested in how political institutions affect government corruption, both in terms of size and pattern (see Mauro 1995; Burki and Perry 1998; Kaufman et. al 1999; Bai and Wei 2000). In addition to the direct effects political institutions may have on investments, quality of government and good governance can also affect economic growth and investments indirectly through protecting the property rights (Knack & Keefer, 1985).

My theoretical point of departure is that the quality of political institutions can affect the countries' level of FDI through the public expenditure of tax revenues, especially in OECD-countries. This theoretical argument is based on *the consensually strong state* (Acemoglu, 2005), where society exercises notable control over the government, yet taxes are still high. This argument goes against much of the literature on political institutions; especially where the large state with high taxes discourages economic growth (North, 1981). Even though it is clear that extreme taxation discourages investments, weak states often fail to make investments that are important for enterprises, such as infrastructure and legal services (Acemoglu, 2005, p. 1202). Thus, investors can accept high taxes, assuming revenues are spent in a way that makes investments easier, and safer. If we consider the European Attractiveness Survey for 2013, reducing the tax rates are not even in the top five priorities of the European enterprises. However, more economic and political integration is seen as vital, a point supporting the theory on the importance of institutions when investing in the EU (Ernst & Young, 2013, p. 40). Based on the theoretical arguments laid out by Acemoglu, I expect that political institutions matter for EU member states, and that the arguments of Acemoglu are relevant for these countries.

In the next paragraphs, I will elaborate my research question and the independent variables chosen to test the research question. I will also discuss the methods I can use and what methods I *should* use, before embarking on the econometric analysis.

3. METHOD AND DESIGN

When deciding on method and design, the structure of the data has several important implications. I have decided to perform a quantitative analysis, and the data used in the thesis supports this. By doing a quantitative analysis, I will be able to measure the uncertainty and errors in the research; this would be impossible through a qualitative analysis. Where the qualitative methods are more case-oriented, the quantitative methods are variable-oriented (Iversen, 2004, p. 896). The goal for the quantitative methods will always be to generalize findings from a sample to a universe, an issue I will return to later. Earlier research in this field has also shown that the quantitative methods and forms of analysis have given a good view of how certain variables affect the inflow of FDI to countries. However, scholars of qualitative methods have criticized the use of quantitative methods. Alan Bryman points out four reasons in particular (Bryman, 2004, p. 78): First that the quantitative researchers do not seem to separate the social institutions from the natural world. Second, the accuracy of the measurements is criticized, in particular that researchers depend too rigorously in correlation and p-values (Bryman, 2004, p. 78). Third, qualitative researchers criticize the quantitative scholars by pointing out the stringency and control, and the last critique relates to the static relationship between the variables, far away from the dynamics of human nature (ibid). While it is true that some quantitative scholars excessively rely on the P-value and correlational relationship between variables, it is also true that qualitative research struggles to measure the relationship between the same variables. As I will show, the variables used in this analysis are based on theoretical expectations of relationships between them and the dependent variable. Also, I will do robustness tests to support the validity of the findings.

There are many forms of quantitative analyses to use when studying the effects national tax regimes have on foreign direct investments, but as I am most interested in studying this over a given time period, either time-series data or cross-sectional time-series data (panel data) are the most relevant alternatives. With panel data, I can observe *n* different units over *t* different time periods, in this case 21 units over 15 years, which would give the analysis 21*15= 315 observations (Stock & Watson,

2007, p. 350)[5]. By looking at changes in the dependent variable over time, I can eliminate the effect of possible omitted variables that vary across countries, but are stable over time (Stock & Watson, 2007, p. 349). This makes my analysis more robust than other forms of quantitative analyses. I will return to this later, but first I will explain the sample of the analysis.

3.1. SAMPLE – EU MEMBER STATES

The universe of the thesis is narrowed down to the EU member states – as defined in the research question. However, because of data availability, or rather the lack thereof, I have not been able to use all of the states. Since I am using OECD statistics for the FDI-data, EU member states in the OECD are my original sample. Even though the OECD statistics databases are thorough and the time span for the data is long, not all the EU member states in the OECD have good enough data availability for this analysis. Thus, Malta, Croatia, Romania, Bulgaria, Cyprus, Latvia and Lithuania have been left out of the analysis, and I therefore have 21 units in my sample (measured over 15 years). This could be a serious challenge to the analysis, as Malta and Cyprus has been regarded as tax havens in a European context, and I will revisit this in the concluding remarks.

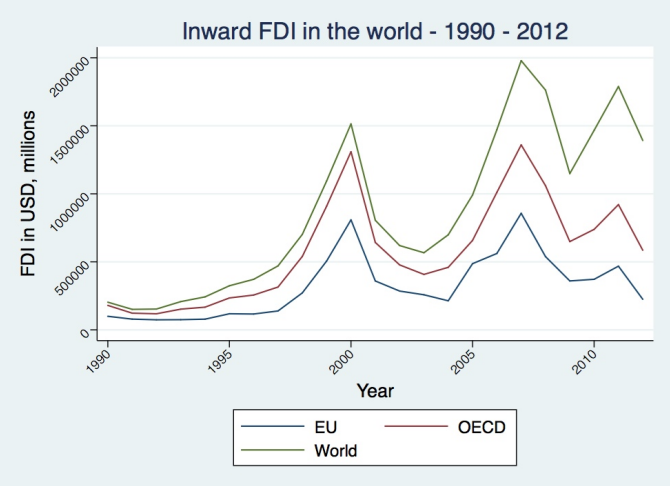
The universe in this thesis is defined as all EU member states. Because of this, the feature of random selection loses some of its meaning. If I were to draw a random selection of EU member states that are also in the OECD database, I would draw the same units every time. This is a challenge to the analysis, as I will not be able to use the P-values as I wish. The problem is larger in analyses where the units are the OECD countries and the universe in the analysis is all of the countries in the world, in my case the universe are almost the same countries as the units (and therefore, my selection is nearly complete). An alternative presented, amongst others by Bruce Western, is to use a Bayesian approach where you average the results across many models, using weights to control for the effects (Western, 1996, p. 166). However, I lack suitable capacity and space required to go through with a Bayesian approach. I

[5] These observations are not 315 independent observations, however, as each country-year is affected by the prior country-year.

will try to mend this with robustness tests as others have done before me (see Rasmussen, 2012). Also, I am close to the actual universe, and therefore will not have a goal of generalizing the findings to a bigger population (Scruggs, 2007, pp. 309-310).

3.2. Dependent variable – FDI as an indicator of MNE activity

Figure 3 Annual inward FDI flows in current US Dollars, millions. Source: OECD statistics



The research question of this thesis relates to how national tax regimes and institutions affect MNE activity in EU member states. I have chosen to use annual stock level FDI relative to GDP as an indicator of that phenomenon, which may need an elaboration: by using annual intervals in a panel data analysis, I can see changes over time in the country-specific variables.

There are several ways of measuring MNE activity, such as sales numbers, employment numbers and the level of FDI. The estimated output or input stock level of FDI has often been used in the empirical literature, though without explaining *why* this measure is a better proxy than for example sales or employment numbers. Many scholars of MNE's use sales data as a measure of their activity, such as the value of goods and services sold or investment income for financial enterprises (Wacker, 2013, p. 8). There are several issues complicating this measure. Mainly that sales data will not give a correct estimate of an MNE's degree of influence in the country it invests in; at least to a lesser degree than FDI (Wacker, 2013, p. 31). Employment data may also be used as a measure of MNE activity, by using the number of employees on the

payroll of the enterprise at the end of the year. The biggest advantage with this measure is that it is a true variable, in that it is not expressed through a monetary measure (Wacker, 2013, p. 8). However, as this measure does not account for the differences in productivity, but on the contrary give every employee the same value, you might not get a sufficient grip of the economic value of each employee (Wacker, 2013, p. 8). Also, this measure will not necessarily give an adequate description of the influence the MNE has on the host country, and the availability of data is not always good; the employment data is often missing (Wacker, 2013, p. 9).

Using FDI data is, however, not without challenges. Challenges using this measurement are, amongst other, related to differences in national accounting systems. The OECD recommends that reinvested earnings and inter-company debt are included in the definition of direct investment, in addition to the more obvious equity investment (OECD, 2009, p. 49). This is included in the FDI-data in my dataset. Also, the capital structure of the MNE creates some problems, as FDI only covers some parts of the assets, and therefore undervalues the assets controlled by the MNE. We could include the total assets of the MNE, but this is not common in literature, mainly because it requires data that is not easily available, but also because the gains are only moderate (Wacker, 2013, p. 7).

Table 2 Bivariate correlations between annual FDI stocks and flows[6]

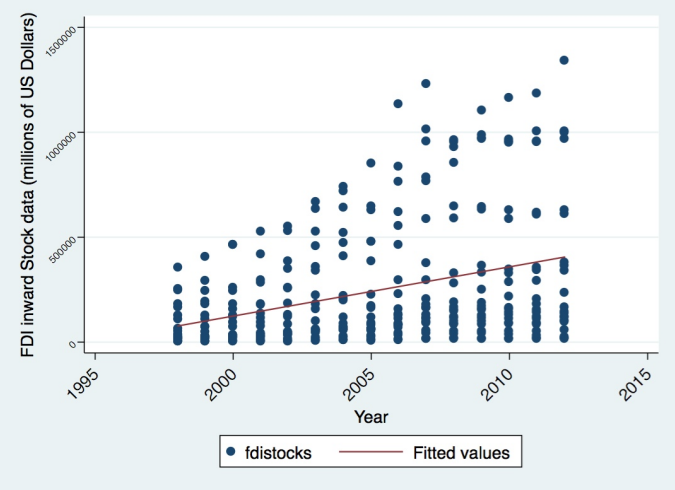
	FDI flows	FDI stocks
FDI flows	1.0000	
FDI stocks	0.6330	1.0000

FDI can either be measured as *flows* or *stocks*. Flow data shows the total transactions being made in a certain amount of time *t* (in this thesis; 1 year), whilst stock data accumulates the flow data. If a country has an inflow of FDI of $1,000,000 in year 1, and another $1,000,000 in year 2, the stock value in year 1 would be $1,000,000, and $2,000,000 in year 2, while the flow data would be $1,000,000 for both years. A challenge using stock data is the valuation of past investments. What an investment of one million US Dollars made in year 1 is worth in year 10 is not an easy task to

[6] I will, where necessary, use up to 3 decimal places in my tables in this thesis.

measure correctly. This is a challenge in the statistics I use, as the stock level FDI is measured in current US Dollars and not with an index or using constant US Dollars (, or another currency). UNCTAD and other statistics databases have different measures, but I give priority to balancing the dataset, and the OECD database is the most complete. Even if stock data is preferable, as it includes all the assets in FDI data, the correlation between stock and flow data is so high that flow data is in most cases sufficient, although the flows fluctuate a lot from one year to the next. Because inflow data fluctuates a lot from year to year, I will perform the analysis using stock data, as most scholars as well have done. Preliminary analyses showed that using the measure of FDI flows per GDP (*fdigdp1*) as my dependent variable did not provide robust results, but the FDI stock level data per GDP (*fdistockgdp*) variable did. This is an annual measure in US Dollars, following the OECD benchmark definition of FDI, and should provide robust and reliant results (OECD, 2013a).

Figure 4 Annual inward FDI stock data in millions of US Dollars, scatter. Source: OECD Statistics



The reliability of parts of the data should be questioned, however, as many of the reporting countries have failed to use the 10 percent threshold in a satisfying manner, especially before year 2000 (International Monetary Fund, 2003, p. 23). Some countries use the percentage threshold as a criterion, but include ownership of less than ten percent, but where the investor still has an effective voice. There is nothing I can do to avoid this issue, and it is a possible error source in the analysis. However, this should be of minor importance in the big picture. It is also important to remember that a subsidiary may start up in a country by lending money domestically, and not

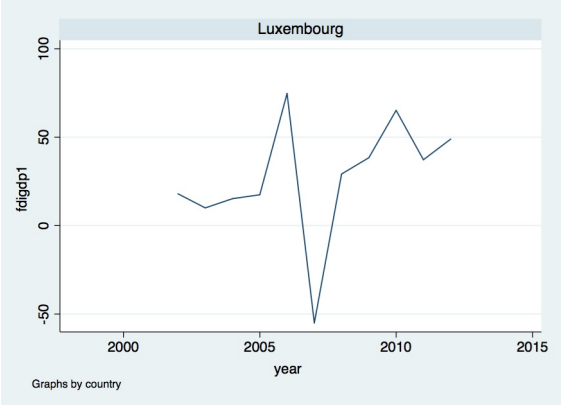
from loans or equity from the parent country. In those instances, the FDI flow will be unaffected, even if a parent foreign enterprise invests in another country (Devereux & Griffith, 2002, 84). This would rather be a part of the Foreign Portfolio Investment (FPI).

Table 3 Descriptive statistics tax

Variable	Obs.	Mean	Std. Dev.	Min	Max
FDI flows per GDP	311	5.693	9.794	-55.074	74.697
FDI stocks	311	243037.9	295457.7	1733.674	1341827
FDI stocks per GDP	311	53.722	48.879	8.887	318.178

As we can see from the descriptive statistics, the level of FDI as a percentage of GDP can fluctuate significantly year-to-year. The extreme levels come from Luxembourg, who in 2007 experienced serious challenges from the financial crisis. If we remove Luxembourg from the analysis, the descriptive statistics show less of a fluctuation in the minimum and maximum values, and a smaller standard deviation. In this sense, Luxembourg is an outlier in the analysis. However, I will include the country, as it is important to include as many units as possible to raise the robustness of the model. Using panel data analysis, it is problematic to drop more units than necessary, as dropping them will reduce the explained variance and reduce the reliability of the analysis. Even though Luxembourg is an outlier, it is still a part of the subject I am interested in, as a EU member state with relatively high levels of FDI in the economy.

Figure 5 Annual inward FDI flows per GDP in Luxembourg



3.3. INDEPENDENT VARIABLES

In section 1.5.1 I explained the variables used in Gropp and Kostial's analysis. I do not possess the same data material as they did, but I will replicate their study with the data available to me from the time period of 1998-2012. First, I will include a measure on exchange rates, where I measure the national currency per US dollars at the end of each year, from the OECD statistics database (OECD, 2014). Gropp and Kostial used an indexed measure, but this exchange rate measure should be suitable for showing the differences between the economic situations in the EU member states relative to USA. Second, I include a measure on the expected growth forecast, also from the OECD statistics database (OECD, 2014). Third, I include a measure of the total share of trade in goods and services, measured in percentage of GDP from the World Development Indicators statistics database (World Bank, 2012). Fourth, I include annual inflation as a measure, from the OECD statistics database (OECD, 2014). As in the analysis by Gropp and Kostial, I will lag the inflation measure by one year. I will also include the total FDI flows relative to GDP.

Table 4 Descriptive statistics of Gropp and Kostial's variables

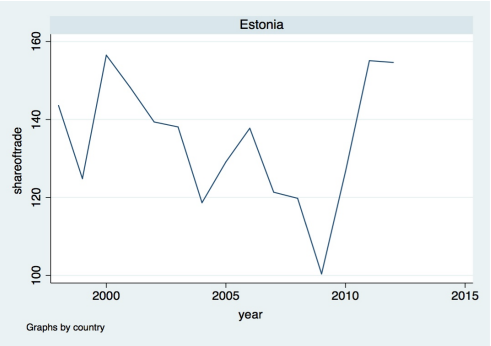
Variable	Obs.	Mean	Std. Dev.	Min	Max
Expected growth	315	2.302	3.272	-14.098	10.971
Inflation (lagged)	314	3.001	2.543	-4.5	18.3
Exchange rate	315	13.218	47.294	.499	286.49
Trade (share of GDP)	312	109.328	56.898	46.641	333.532
Total FDI (in and out per GDP)	307	.098	.158	-.156	1.326

As we can see from the descriptive statistics, there are big fluctuations in both the exchange rate variable and the share of trade variable. Especially Hungary (exchange rate) and Estonia (trade) deviate from the rest of the countries. Hungary had, in the beginning of the 2000s, a high level of national units per US Dollar, relative to the other countries involved in the analysis. This is shown in figure 6. Figure 7 shows how the share of trade variable fluctuates from year to year in Estonia. The measure, merchandise trade as a share of GDP, is the sum of exports and imports in merchandise, divided by the value of GDP (current US dollars). The merchandise

sector in Estonia suffered in the aftermath of the financial crisis, but quickly regained it's status when it joined the Euro cooperation and the Euro group in 2011 (European Commission, 2012).

Figure 6 Exchange rate fluctuations, Hungary. Source: OECD statistics

Figure 7 Share of trade, Estonia. Source: OECD statistics



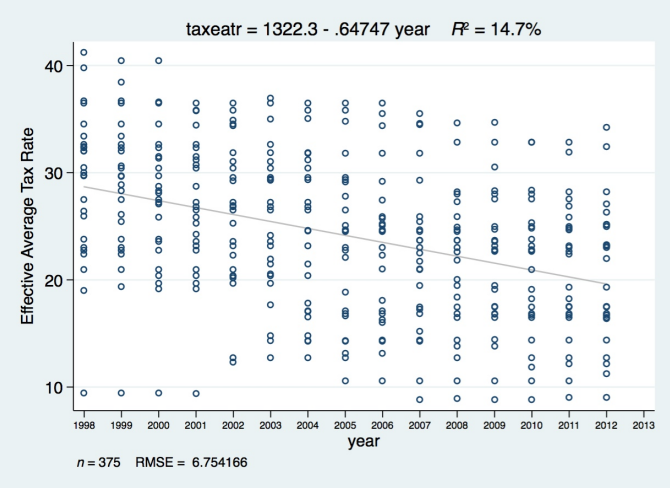
3.3.1. TAX VARIABLES

While it is clear that the thesis will test how national tax regimes affect the inflow of FDI in that country, it is less clear how to measure the tax rates. Prima facie, one would use the statutory capital tax rate, as they represent the rate the governments set. However, there are many forms of exception policies and other forms of incentives for investing enterprises in the EU member states. Also, the size of the tax base matters for the statutory rate. A large tax base might compensate for a low statutory tax rate (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003, p. 11).

The Dévereux/Griffith methodology tries to solve this problem by adding the average effective tax rate into the research, in addition to the marginal effective tax rates, and the apparent effective tax rates (see Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003 for empirical research). The correct method of measurement depends on what you are trying to measure. The average tax rate is a good measure to use if you assume that the investor wants the highest post-tax return possible. However, the amount of investment will be determined by the point where the expected pre-tax rate of return equals the cost of capital, and in this case, the marginal tax rate would be preferable. As the corporate tax regimes generally are non-linear, the marginal tax rate and the average tax rate may differ in a significant way (Devereux & Griffith, 2002, 89). We could also use the effective tax rates, which are forward-looking, and often used for specific investments (calculating, for instance, the investment of production facilities for a car manufacturer).

The methodology developed by Dévereux and Griffith expects that it is the statutory or the average effective tax rates that affect the locational decision of the MNEs, whereas other tax measures influence the decisions on whether or not to reinvest in the host country (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003, p. 11). When Devereux and Griffith researched where MNEs want to produce (locational decision), they found that the effective average tax rates were significant in the analysis, but not the marginal tax rates (Devereux & Griffith , 1998).

Figure 8 Effective Average Tax Rates in EU member states - development (scatter)



I will therefore use the Devereux/Griffith methodology with tax rates developed by Christoph Spengel, Christina Elschner and Dieter Endres through the project "Effective tax rates in an enlarged European Union", at the Centre for Economic Research. The tax rates are available from 1998-2012[7] (Spengel, Elschner, & Endres, 2012). By using the effective average tax rate (EATR) I measure the tax rates in a way that accounts for the national differences in exceptions and subtractions, and measures effective tax rates on domestic investment. They take into account company-level taxation, but not personal shareholder taxation, and no cross-border taxation.

The existing literature and research forms the basis for my hypotheses for this variable:

H1: There is a significant and negative relationship between high corporate tax rate in the host country and the level of FDI.

H2: The relationship between corporate tax rates in the host country and the level of FDI weakens, as political variables are included in the analysis.

[7] See table 16 in the appendix for development of the statutory tax rates in the EU.

The literature presented so far seems to confirm that the corporate tax rate matters in the locational decision for a MNE. However, Tiebout pointed to the fact that not only taxes matter, but that the provision of public goods plays an important role as well (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2003, p. 9). This means that if there are high levels of public goods in a country, a taxpayer might accept high rates of corporate tax, because of personal preferences. This means that the clear-cut connection between tax rates and FDI inflows might be exaggerated. This will be elaborated after the quantitative analysis.

Table 5 Descriptive statistics for EATR

Variable	Obs.	Mean	Std. Dev.	Min	Max
Effective Average Tax Rates	315	25.622	6.523	9.361	41.191
Statutory Tax Rates	315	28.393	7.080	12.5	56.046

There are considerable fluctuations in the tax variable, and this gives the analysis a good starting point. We find the lowest Effective Average Tax Rates in Bulgaria from 2007-2012, whereas Germany holds the highest effective average tax rates. If we exclude the two countries, the mean changes to 24.03 and the standard deviation does not change significantly: 6.8. We can also see that if we correlate the EATR measure with the statutory tax variables from the OECD statistics database, the correlation is present, but there clearly is a difference, especially in Belgium and Greece. It also becomes apparent that there is a difference between the statutory tax rates and the EATR, even if the correlation is high between them.

Table 6 Bivariate correlations between statutory tax rates and effective average tax rates

Variable	Statutory	EATR
Statutory	1.0000	
EATR	0.8980	1.0000

3.3.2. INFRASTRUCTURE

I include infrastructure in the analysis, as Bellak et al did in their analysis of determinants of FDI in Central and Eastern European countries (Bellak & Leibrecht, 2008). The theoretical argument is that an increase in public expenditure on infrastructure reduces the transportation costs for the MNE investing in the country, thereby increasing the attractiveness of the country. This is a variable few of the empirical analyses on the field have included, but I have chosen to do so because I believe that infrastructure is important for investors in the EU, especially considering the closeness to other countries and markets in the EU. Also, a higher public spending on infrastructure works as a complimentary good to the tax rates, and might in that sense reduce the effect of a low corporate tax rates. Infrastructure represents the output of government performance, and can as such work as a proxy for good governance.

The measure is taken from the EUROSTAT statistics database, and measures the total amount of motorway in the country at the end of each year, measured in kilometers per square kilometer, so that the size of the country is controlled for[8] (Eurostat, 2013). I could have measured infrastructure by using public expenditure on infrastructure budgets, but that would have measured the phenomenon on the input rather than the output. A transport company would be more interested in how many roads that are being built, more than how much money they cost. Therefore, I use the amount of kilometers as my measure on infrastructure. In addition, the data on public expenditure on infrastructure endowments are not complete, and would reduce the number of variables in the panel data analysis.

On the basis of the last paragraphs, I expect the following relationship between public spending on infrastructure and the inflow of FDI in the host country:

H3: There is a significant and positive relationship between infrastructure in the host country and the level of FDI

[8] Kilometers of motorway, divided by the square kilometers of land area in the country. Area statistics are gathered from the EU. http://europa.eu/about-eu/facts-figures/living/index_en.htm

I also include the conditional hypothesis from Bellak et al on the relationship between tax rates and infrastructure (2009, 268):

H4: The importance of lower tax rates decreases with an increase in a country's infrastructure endowment.

Table 7 Descriptive statistics for infrastructure - motorway

Variable	Obs.	Mean	Std. Dev.	Min	Max
Motorway per sq. km.	257	20.956	19.511	0.857	78.017

The measure does not take into account the differences in country size, and this explains the large differences in minimum and maximum values. Obviously, there are no EU member states without motorways, so the minimum values are in fact missing values. France and Spain dominate the growth in kilometers of motorways, as we can see in figures 9 and 10.

Figure 9 Kilometers of motorway, Spain

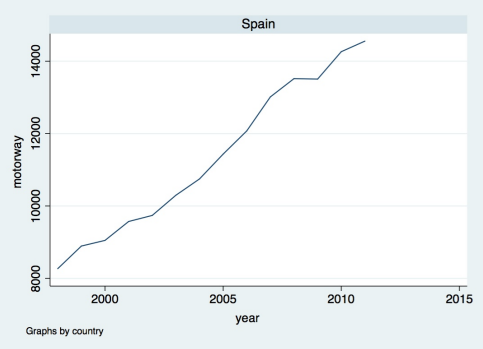
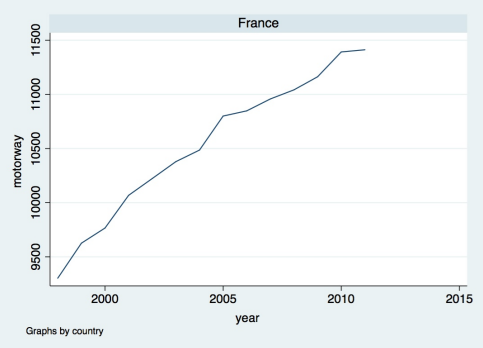


Figure 10 Kilometers of motorway, France



3.3.3. THE INSTITUTIONAL VARIABLES

I claim that institutions matter, in line with the research of Acemoglu (2005), where certain countries can have high tax rates and a high level of investments, as the revenues from the taxes are spent on complimentary goods important for the investor and the population. The empirical effect of political institutions, although difficult to measure, has been shown by many scholars to be significant (see Blonigen, 2005). Also, an investor is less willing to invest in a country with low political stability, many strikes, conflicts in the labor market and other challenges that can affect productivity and profitability for the investment.

However, when considering which variables to include in the analysis, the picture is not so clear. Most of the measures use indexes including data on political, economical or legal institutions, often stemming from survey data (Blonigen, 2005, p. 390). Fatica (2010) included biannual survey data on rule of law and government effectiveness, while Daude and Stein (2007) especially saw that governmental instability, excessive regulation, and the unpredictability of laws played an important role in *deterring* FDI. By using institutional variables originally developed by Kaufmann et al. (1999), their results showed that regulatory quality and governmental effectiveness seem to be the most relevant institutional variables (Daude & Stein, 2007, p. 327).

I will include institutional variables developed by Kaufmann et al. (1999), gathered by the World Bank in their Worldwide Governance Indicators (World Bank, 2013). The data set includes data on *control of corruption* (corruption), *government effectiveness* (goveffect), *political stability and the absence of terrorism* (polstab), *rule of law* (ruleoflaw), *regulatory quality* (regqua), and *voice and accountability* (voice). The first indicator, control of corruption, is a measure on the extent to which public power is exercised for private gain. The second, government effectiveness, measures the perception of the quality of the civil services, quality of policy implementation and credibility of the government. Political stability and the absence of terrorism and violence measures the perceptions of likelihood that the government will be destabilized or overthrown, while the rule of law measure captures the confidence in

quality of contract, property rights, and the police and legal system. The indicator of regulatory quality captures the perceptions on the government's ability to implement sound policies and regulations. Voice and accountability is the last indicator, and this captures perceptions on freedom of expression, the ability to participate in elections and so forth. All the indicators are measured as percentile ranks, i.e., ranging from 0 to 100.

These variables have been used by many scholars in different analyses, and are in general judged to be relevant when measuring the quality of institutions (Kaufmann & Kraay, 2002, p. 7). However, the measures have shown to be highly correlated with each other. This raises the issue of multicollinearity, which I will pay special attention to in the analyses.

Figure 11 Bivariate correlations FDI, EATR, and institutional variables

fdistocks	0.415	-0.199	0.334	0.289	-0.334	0.275	0.302	0.312
0.415	taxeatr	-0.080	0.293	0.253	-0.254	0.039	0.213	0.235
-0.199	-0.080	growth	-0.015	-0.012	0.174	0.014	-0.094	-0.039
0.334	0.293	-0.015	corruption	0.945	0.453	0.821	0.949	0.934
0.289	0.253	-0.012	0.945	goveffect	0.497	0.842	0.940	0.897
-0.334	-0.254	0.174	0.453	0.497	polstab	0.451	0.453	0.481
0.275	0.039	0.014	0.821	0.842	0.451	regqua	0.839	0.825
0.302	0.213	-0.094	0.949	0.940	0.453	0.839	ruleoflaw	0.905
0.312	0.235	-0.039	0.934	0.897	0.481	0.825	0.905	voice

As we can see from figure 11, there is substantial multicollinearity between corruption and *goveffect*, *ruleoflaw* and *voice*. There are also other worrying correlations between some of the other institutional variables. Therefore, I will only include *corruption* in the analyses in the next chapter.[9] This variable is also the most interesting substantially, as it is the most concrete and direct measure on good governance and institutional quality in the dataset.

However, it is not only the quality of the institutions that are important when investing; the quality of industry is as well important. To measure the industrial quality in a country, I use employment data and data on union density, gathered from OECD statistics (OECD, 2013c). Union density data is based on the proportion of the full labor force with a union membership, while the employment data is measured as the total labor force as a percentage of the population in the country. I expect that countries with higher unionization and lower unemployment have a higher proportion of inward FDI than other countries. Of course, it may also be that higher unemployment and lower unionization gives leverage to the investors, making the labor costs lower than in other countries. In that case, we will see a different outcome in the analyses. Some has used data on union fractionizing, but I have chosen to use data on union density, as it covers the stability of unions in a better way than fractionizing can.

Thus, I include also the following hypotheses related to the variables included:

H5: There is a significant and positive relationship between good governance and the level of FDI.

H6: There is a significant and positive relationship between the union density in the host country and the level of FDI.

H7: There is a significant and positive relationship between employment and the level of FDI.

[9] I have run many regressions using different measures, and the results do not change in a substantial way when leaving out these variables.

Table 8 Descriptive statistics for political and industrial stability

Variable	Obs.	Mean	Std. Dev.	Min	Max
Corruption	273	84.238	12.733	51.196	100
Political stability	273	76.982	15.661	30.143	100
Regulatory quality	273	87.751	8.528	66.667	100
Rule of law	273	85.527	11.929	57.894	100
Union density	276	32.957	19.857	7.050	81.285
Employment	251	49.391	5.855	39.067	74.294

The variable *corruption* shows that there are no countries below a level of 51,2%. The variable measures the degree to which power is exercised for private gain (small and big forms of corruption) (World Bank). Most EU member states have a high level on this measure, but certain countries such as Bulgaria, Greece, and Slovakia are in the lower ranks of the Union. For the variable *polstab*, we can see that the scores fluctuate to a larger degree than corruption (see standard deviation). This variable measures the perception of the possibility for a destabilization of government or the likelihood for violence and terrorism motivated by politics (World Bank). A high score (like Sweden) means that the political stability is perceived to be high, but a low score (like Spain, UK) means that the political stability is perceived to be low. *Regqua* fluctuates the least, and this is the indicator with the highest minimum value, showing high quality, although the mean is at about the same level as *corruption* and *ruleoflaw*.

We can also see that there are big differences between the countries on union density. As expected, the Nordic countries like Sweden and Denmark have the highest density, while Spain, Estonia and France has the lowest union density. However, data for Bulgaria, Cyprus, Latvia, and Lithuania is missing from the OECD database. Data on union density is relevant for the quality of institutions because countries with high union density have institutions that take the interest of the society as a whole into account (Olson, 1982, p. 92). Olson talked more about the fragmentation of the unions, however I do not possess data on that, only on union density. We could, however, also claim that more comprehensive unions hinder growth (Olson, 1982, p. 107). The statistical analysis will hopefully provide us with some answers.

3.4. CONTROL VARIABLE - ECONOMIC GROWTH

I include data on log GDP per capita gathered from the OECD statistics database as a control variable for the economic growth in the country (OECD, 2014). I expect that FDI inflows are lower in the time after a drop in GDP per capita. As this is such an important indicator of a country's economic development and therefore for the quality of the institutions, I will include the variable in all the models except the replication model based on Gropp and Kostial's analysis. The measure is taken from Eurostat, measuring nominal GDP per capita in current Euros per inhabitant.

Table 9 Descriptive statistics GDP per capita and Log-transformed GDP per capita

Variable	Obs.	Mean	Std. Dev.	Min	Max
GDP per capita	315	23953.33	13981.26	3600	80700
Log GDP per capita	315	9.893	0.664	8.188	11.298

3.5. TIME SERIES CROSS-SECTIONAL DATA: PANEL DATA

As a researcher or a student, you would like to make contributions to the research literature. In the quantitative sciences, you want to infer as much as possible from the available data. Cross-sectional data give you the possibility of comparing different units, while time-series data make it possible to study a phenomenon over time. By combining these, you have cross-sectional time-series data, often referred to as panel data. By measuring multiple variables over time, the amount of measuring-points grow, something that mends some of the main issues in comparative studies in the social sciences, that there are too many variables and too few observations (Lijphart, 1971).

The variables in the analyses are measured both across countries and time. As previously explained, the panel data is a favorable tool for researching changes over time – both in time and space. There are many different models I can use in STATA for this purpose, and earlier research has not shown that one specific model is superior to others, rather that different models suit different data structures. However, I argue that Ordinary Least Squares (OLS) modeling with Panel Corrected Standard Errors (PCSE) suit the data structure I have; a short time-series.

Quantitative research in general, and panel data analyses specifically, has been criticized for overconfidence in the results from the analysis. Some of the criticism comes from simply believing that time-series analysis and panel data analysis gives x times t observations. More often than not, autocorrelation will reduce the *actual* number of observations, making the analysis less robust than wanted (Pennings, Keman Hans, & Kleinnijenhuis, 2009, p. 43). Also, heterogeneity is an issue panel data has to solve. I will return to this after a discussion on Feasible Generalized Least Squares versus Ordinary Least Squares analysis.

3.5.1. WHY NOT FEASIBLE GENERALIZED LEAST SQUARES (FGLS)?

As noted earlier in the thesis, Gropp and Kostial used a model often used in panel data analysis; Feasible Generalized Least Squares. This is an econometric analysis offered in most of the software packages available, and was introduced for TSCS data by Richard Parks in 1967. In short, GLS is used to handle heteroscedasticity and correlation between the observations, so as to make the estimation more efficient (Parks, 1967)[10]. Also, it should handle unit specific serial correlation (Beck & Katz, 1995, p. 637). These issues have always been a challenge for panel data, and made many scholars rule OLS out as the best linear unbiased estimator (BLUE).

GLS has over time been criticized by many scholars, in particular in the article *What to do (And not to do) with time-series cross-section data*, written by Nathaniel Beck and Jonathan Katz (Beck & Katz, 1995). When using the Parks method of GLS, the size of the error terms are underestimated, as the method assumes knowledge about the error processes, knowledge that we do not have (Beck & Katz, 1995, p. 634). Since we do not have that knowledge, the Parks method, according to Beck and Katz, should be referred to as a *feasible* GLS estimator, estimating the errors. As a consequence, "[…]the Parks method falsely inflates confidence in the findings of TSCS studies" (Beck & Katz, 1995, p. 634). Importantly, the error processes are more complicated for panel data than just cross-sectional or time-series data. Had the error processes been known, then the GLS method would be preferable, however, the error processes rarely, if ever, are (Beck & Katz, 1995, p. 637).

Gropp and Kostial (2000) used the feasible GLS analysis that Beck and Katz criticize. As they use the level of significance as a basis for their conclusions, the critique from Beck and Katz is timely, as the FGLS estimator might underestimate the error terms. Also, they used fixed effects, which is discouraged for shorter time series (Buddelmeyer, Jensen, Oguzoglu, & Webster, 2008). In chapter 4, I will show how using a different estimator might change the results in a substantive way.

[10] For more information on how the GLS estimator works

3.5.2. WHY ORDINARY LEAST SQUARES (OLS)?

Using ordinary OLS regression with panel data was for a long time criticized for the same flaws that Beck and Katz found with FGLS estimators. Thus, using OLS is not necessarily without challenges. One of the main criteria for OLS to be BLUE (Best Linear Unbiased Estimator) is that the error terms are independent of each other. In panel data analysis, there is reason to believe that the error term for variable *x* in country *z* in year *t* in some way is correlated with the error term for variable *x* in country *z* in year t_2. Also, the error terms for two different variables in the same year may also be correlated. Thus, the prerequisites for using OLS will not be fulfilled, and we will need to optimize this if we are to use the OLS regressions (Beck & Katz, 1995, p. 636). However, if we are able to correct the correlation of the errors, the OLS estimator becomes more consistent and efficient than FGLS estimators. This should be possible with panel data because we have information on the correlation of the errors over time (Beck & Katz, 1995, p. 638). By knowing this, we can introduce Panel-Corrected Standard Errors (PCSE). Beck and Katz tested the PCSE model in a Monte Carlo experiment, and found that the accuracy of the OLS with PCSE is much higher than Parks method of GLS (Beck & Katz, 1995, p. 640): "[…] Thus, PCSEs dominate OLS standard errors; when PCSEs are not necessary, they perform as well as the OLS standard errors, and when OLS standard errors perform poorly, PCSEs still perform well".

3.5.3. TROUBLE LURKING IN THE WATER

Even if the PCSEs make the OLS estimator better than FGLS, there could still be trouble lurking in the water. In particular, autocorrelation, heteroscedasticity in the residuals, correlated residuals because of exogenous shocks, and endogeneity are issues I have to confront in the analysis.

The issue of *endogeneity* arises when an explanatory variable is correlated with the error term (Wooldridge, 2002, p. 50). Usually, the endogeneity comes from one of three ways (Wooldridge, 2002, pp. 50-51): (1) *omitted variables*, where you, because of a lack of variables to control for, get a correlation between the variables and the

error term. Usually you include a variable that is correlated in some way with an excluded variable, and the explained variation is therefore in the error term. This reduces the explained variation, as well as raises the insecurity in the analysis, and is often referred to as omitted variable bias. (2) *Measurement errors*, where you want to measure a phenomenon, but the data only partly measures it. Wooldridge use the difference between the marginal tax rate and average tax rate as an example (Wooldridge, 2002, p. 51). (3) *Simultaneity*, which happens when the explaining variable(s) are determined at the same time with y, so that the chain of causality is not clear. An example would be the relationship between car accidents and speed limits, where the number of car accidents might also affect the speed limits. The theoretic expectation of the direction of causality is the best way of preventing problems of endogeneity. Also, one can use the results from the econometric analysis, as counter-intuitive results can happen because of endogeneity problems.

Heteroscedasticity occurs when the variance of the residuals is dependent on the values of the explanatory variables (Midtbø, 2012, p. 106). While heteroscedasticity does not affect the explained variance (R^2), and the OLS estimator is still unbiased, the standard errors and confidence intervals are affected. As we want homoscedasticity in our data, we have different possibilities, but what turns out to be most efficient with my data structure is, introducing panel-corrected standard errors (Midtbø, 2012, p. 109). By including panel corrected standard errors in the OLS PCSE method, the problem of heteroscedasticity is reduced (Beck & Katz, 1995).

When the residuals are correlated with each other over time, *Autocorrelation* is present (Midtbø, 2012, p. 112). This represents a breach of the prerequisite for OLS estimation: no correlation in the residuals. By ignoring this, the standard errors are underestimated, and the significance numbers, overestimated. By adding a lagged dependent variable on the right hand side of the equation, the problem is reduced (Beck & Katz, 1996, 4). There can also be simultaneous correlation, where for instance geographically close units (as countries) experience common shocks, or quite simply compare more favorable to each other than to countries farther away. By

adding PCSE into the OLS estimator, this problem should as well be reduced. I will control for autocorrelation by including the autoregressive function (AR1) in STATA, as there are theoretical reasons to expect autocorrelation when using stock level data. The face validity of the claim that the stock level of FDI in *t* is affected to a large degree by the stock level in t_{-1} is high, and it might also be affected to some degree by the level in t_{-2} and t_{-3}.

I can also face *unit and time specific effects*, such as exogenous shocks and country-specific attributes that are difficult to measure in the analysis. A possible solution to this is to use a Fixed Effects model. When choosing whether to use a Fixed Effects model, the rule of thumb is that the time points should be larger than 20 if you are to use the FE model. In my analysis, I analyze the research question using data in a time span shorter than 20 years; so using the FE is not recommended. Also, by using the FE model, I exclude the possibility of comparing countries as information, as the model only uses "within-country" information (Wooldridge, 2002, p. 267). I return to this in 3.6.1, but first I want to explain the OLS PCSE model.

3.6. OLS WITH PANEL-CORRECTED STANDARD ERRORS

The previous paragraphs have shown that OLS with PCSE is a good model to use with the data structure in my thesis. I have accounted for and clarified the possibilities and challenges you face when choosing which model to base your analysis on, and OLS with PCSEs will give more correct output than for instance the FGLS model that Gropp and Kostial used. Beck and Katz put the OLS PCSE through Monte Carlo experiments, and showed that the errors generated by PCSE were completely independent of the explanatory variables, and were on average more accurate than Park's method (Beck & Katz, 1995, pp. 641-642). By using OLS PCSE analysis, I will by default reduce the probablility for heteroscedasticity and simultaneity, as pointed out by Beck and Katz. The issue of endogeneity is still present, although reduced. Omitted variable bias is difficult to control for in the sense that you have a theoretical point of departure. Also, there is a need for a discussion on the degree to which the phenomena I want to control for is measured by the indicators I include. I will return

to these questions in the next chapter. To reduce the risk of autocorrelation, I will include autoregressive variables in the analysis. There is a theoretical argument to support this. As I am using stock level data, the level of FDI in year t_1 is dependent of the value in t_0, therefore it is important to include the measure both for methodological, but also theoretical reasons.

3.6.1. How about the financial crisis – "lagging the dog"?

Now and again countries experience shocks common to all countries – like the financial crisis that hit most of the developed world in 2007 and 2008. The European Union was hit quite dramatically, as we can see in figure 3 as well. This is an external shock, which is not easy to control for using the statistical analyses I have accounted for thus far, as I am mostly looking at variation between countries in the OLS PCSE, auto regressive models and the FGLS-models. However, by using a Fixed Effects-model (FE), I can account for external shocks that happen simultaneously in all countries by looking at within-country variation. This is done by including dummy-variables for each country, and by giving each unit its own constant term. However, this method does not come without drawbacks. First, FE models have serious problems with estimating time-invariant and rarely changing variables (Plümper & Troeger, 2007, p. 124), in particular important for the institutional variables used in this analysis, but also the tax variable in some countries. Second, using FE estimators with short time spans rarely fosters robust results, and research has shown that OLS is in fact BLUE when t<20 (Buddelmeyer H., Jensen, Oguzoglu, & Webster, 2008). Because of this, I will not base my main analysis on the FE model, but I will include this as a robustness test. Using Fixed Effects model also has consequences for the substantial interpretation of the analysis, as the model can give non-significant results for an explanatory variable that actually is significant, just because it is relatively time-invariant (Buddelmeyer H., Jensen, Oguzoglu, & Webster, 2008, p. 2). Also, Beck & Katz argued that leaving out the FE could be better (or rather, less worse) than including them, especially since collinearity becomes a problem with the FE model, and you risk losing important information from the analysis (Beck, 2001, p. 285). I have some variables included in the analysis that do not change significantly from year

to year (especially the tax level and the institutional variables for certain countries), and this can reduce the explanatory power of the FE model. I will, however, include the model as a test of robustness, especially considering the magnitude of the financial crisis in 2007-2008 and the repercussions this brought, that could have substantial implications for my results.

I will now proceed with my analysis: I will first replicate Gropp and Kostial's analysis using the feasible GLS analysis with fixed effects for my time period. Second, I will then perform the same analysis; this time using an OLS PCSE model. Finally, I will include political variables in the analysis. Remembering the hypotheses from chapter 2, I expect that the importance of the corporate tax rate to be reduced as a consequence of including political variables.

4. ANALYSIS

We have finally arrived to the most exciting part of the thesis, where theory, methods and variables meet. I want to test the hypotheses set out in the beginning of my thesis, based on the theories on tax competition and the role of political institutions. After the chapter on the OLI-paradigm, we have learned that both institutional and tariff based considerations are used when MNE's decides whether to invest. Earlier research on the field of FDI has included papers on institutions and taxes, but for the most part in isolation (Fatica, 2010, p. 1). Most, if not all, of the studies on taxation and FDI concludes that high taxes affect inward FDI flows in a negative sense, and some studies has shown that a reduction of corporate tax rates in high-tax countries may benefit their inward FDI flows (Gropp & Kostial, 2000, p. 8).

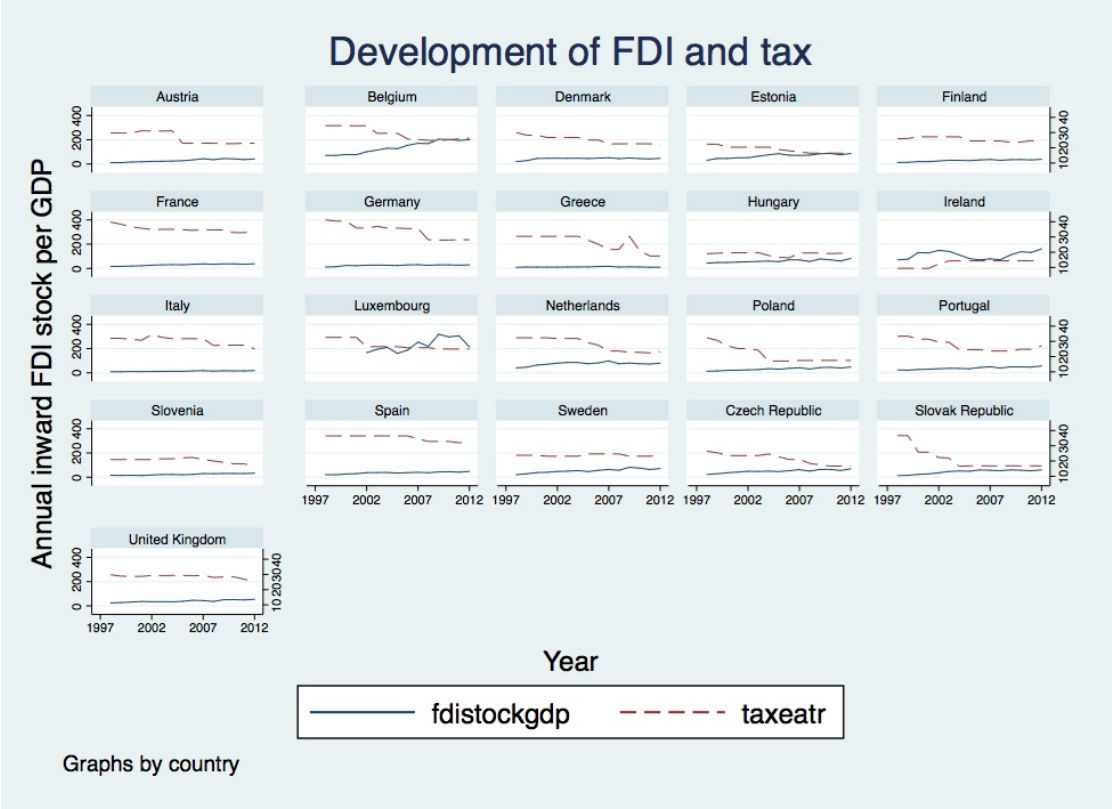
I shall now test the theoretical arguments and see whether institutions matter more than the corporate tax rates. Before going to the substantial discussion, I will in 4.1 try to give an overview of the data through descriptive statistics, before I in 4.2 give an outline of the baseline model, and show what happens when we go from a FGLS model with Random Effects to an OLS PCSE model. This lays the foundation for the rest of the analysis, where I go more into the specific effects of tax and institutions, before I finish the chapter with some robustness tests, where I use different operationalizations of the institutional variables.

4.1. DESCRIPTIVE STATISTICS

Before we embark on the OLS analysis, it is useful to get an idea on how the data looks. I have therefore computed panel data plots showing the development of the variables of interest. The first plot shows the development of annual level of inward stock FDI measured relative to GDP for each country, while the dashed line represents the development of the Effective Average Tax Rates (EATR) for the same countries. As we can see, Luxembourg inflates the scale, making it more difficult to interpret, as they have FDI levels of close to 400% of GDP in some years, but excluding the country does not change the findings substantially. We can see that the general level of FDI has grown the last 15 years, while the average tax rate has dropped in most of the

countries. It is interesting to see that even though Ireland has raised their tax rates, the level of FDI does not seem to be affected by it (at least not in this plot). There does not seem to be a large drop in FDI relative to GDP in the aftermath of the financial crisis, but the scale makes it difficult to see. Luxembourg probably makes the best case, where FDI is such a big portion of the economy, and we can clearly see a drop in FDI around 2007-2008.

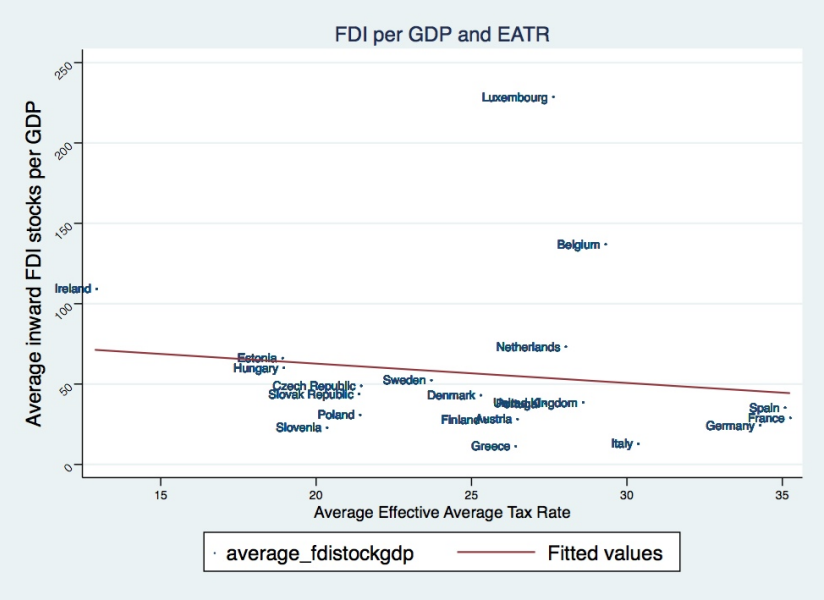
Figure 12 Development of FDI and tax



This figure does not tell us much about the relationship between the variables, so I made a new plot showing the bivariate correlations between FDI per GDP and EATR (figure 13). The plot shows the mean value of each indicator for each country, and not surprisingly, the expected relationship is as earlier research has claimed (we will return to this question in the econometric analysis), and higher taxes reduce the inward FDI. As we can see, Ireland and to some extent Luxembourg represents the outliers, while the large economies of France, Germany and Spain end the spectrum with high taxes and low values of FDI per GDP. As written, this is only the mean value, and it is thus

too early to conclude. I will therefore continue with the bivariate correlations between FDI per GDP and the institutional variables.

Figure 13 Average bivariate correlations between FDI per GDP and EATR



When looking at the fitted values for the next figure, there seems to be a positive relationship between FDI per GDP and a positive score on *corruption*. Again, Luxembourg represents an outlier, with a high score on both variables, but removing Luxembourg from the analysis barely changes the fitted line through the plot. Not surprising, it is the Nordic countries that have the highest score on the corruption variable, while the post-communist states have the lowest scores. Perhaps more surprising is that they do not necessarily have more inward FDI, at least not relative to their national GDP.

Figure 14 Average bivariate correlations between FDI per GDP and corruption

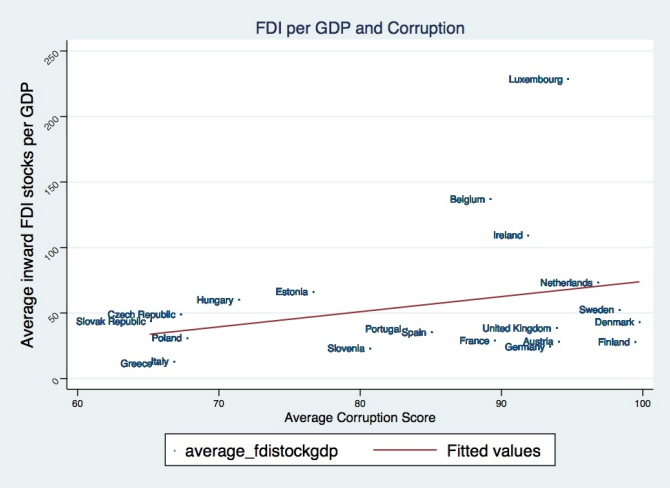
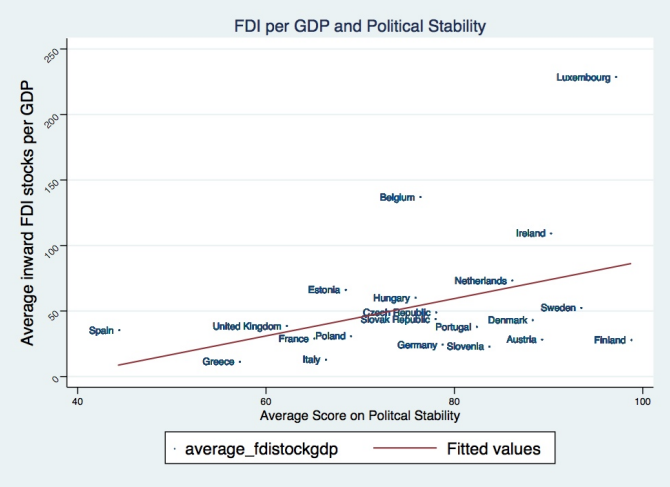


Figure 15 Average bivariate correlations between FDI per GDP and political stability



When looking at how the bivariate relationship between FDI per GDP and the indicator *polstab* (political stability and fear of terrorism) pans out, you see that there is a positive relationship between the FDI indicator and a high score on *polstab*, similar to the earlier plots. I include the two last indicators below, first *regqua* (regulatory quality) and then *ruleoflaw* (the rule of law in the countries). The results follow the theoretical expectations, where high scores on the indicators coincide with higher levels of FDI per GDP. Again it is the post-communist countries that have the lowest score on the institutional variables.

Figure 16 Average bivariate correlations between FDI per GDP and regulatory quality

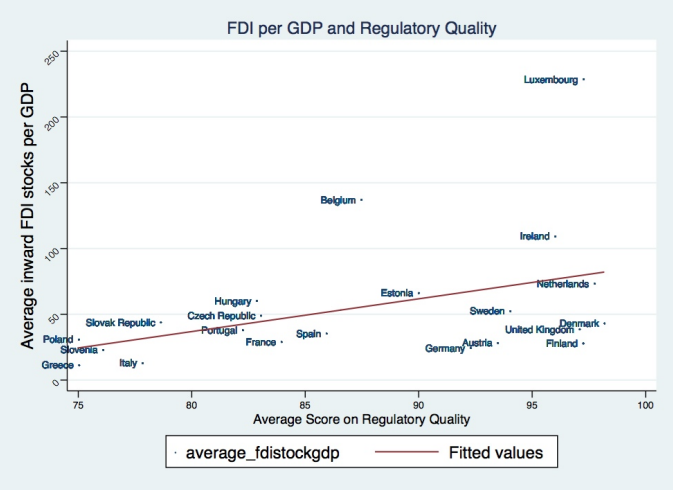


Figure 17 Average bivariate correlations between FDI per GDP and rule of law

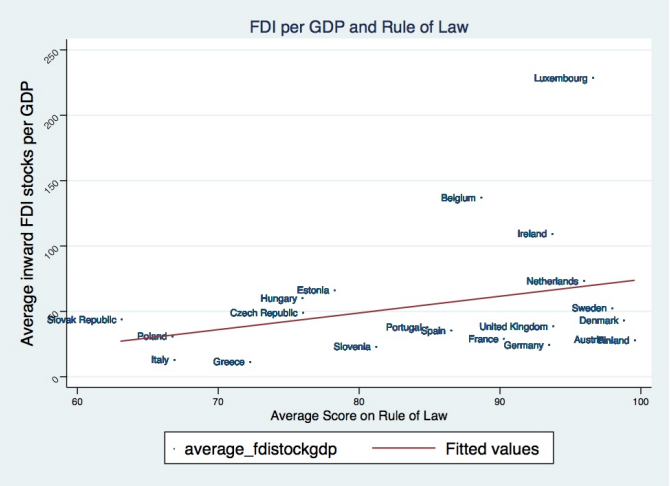


Figure 18 Average bivariate correlations between tax and rule of law

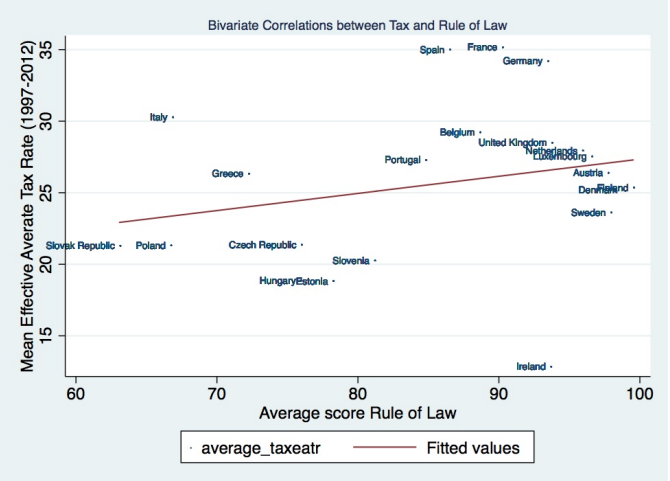


Figure 18 shows us the bivariate correlations between the Effective Average Tax Rate and *ruleoflaw*. I could have used any of the other institutional variables, as they show the same result. There seems to be a positive relationship between taxes and good governance, in that countries with a higher score on the institutional indicators also have relatively high tax rates. This seems to support Acemoglu's (2000) theory that some countries can have higher tax rates and still attract investments, certainly if the revenues are spent on public goods important for the investors. Ireland represents the biggest outlier, together with Italy. The countries are interesting in their own way; Ireland because they have low taxes but high scores on the institutional variables; Italy because of the opposite, they have higher taxes, but some of the lowest scores on the institutional variables.

4.2. BASELINE MODEL

Table 10 shows us the differences between the Feasible Generalized Least Squares Random Effects and the Ordinary Least Squares Panel-Corrected Standard Errors models. Remembering from 3.5.1, FGLS underestimates the error terms, leading to overconfidence in the results. We can see from the table that this is at least partly confirmed in the data material. First, the error term of the EATR measure and the amount of total FDI flows grows. As expected, the effect of the tax variable stays negative, but is no longer significant. We can conclude from this replication that Gropp and Kostial's findings not necessarily are wrong, only that the model specification used most likely is not the best estimator. The results are (as of yet) not robust enough to accept the conclusion that lower tax rates increases the FDI in the host economy – these preliminary results do not give reason for making such a claim. However, this is not the ending point of my analysis, this is only the beginning. I have showed what I wanted to show, that model specification and robustness testing is important for the validity of the empirical analysis.

Table 10 Feasible Generalized Least Squares vs. Ordinary Least Squares with Panel Corrected Standard Errors. Dependent variable: FDI stocks per GDP

VARIABLES	COEFFICIENTS	
	FGLS RE	OLS PCSE (AR1)
Tax	-0.313	0.041
	(-1.11)	(0.09)
Growth	-1.758*	-1.638*
	(-5.87)	(-2.94)
Inflation (lagged)	-0.442	-0.638
	(-0.94)	(-1.07)
Exchange rate	-0.066	-0.068
	(-1.01)	(-1.40)
Trade (share of GDP)	0.677*	0.602*
	(12.11)	(4.08)
Total FDI (in and out)	36.16*	21.98
	(4.35)	(1.28)
Constant	-7.414	-8.929
	(-0.64)	(-0.39)
R^2	0.754	0.356
N	303	303

t statistics in parentheses, $^{+}$ $p < 0.10$, * $p < 0.05$

Of a possible 315 observations, we have 303, and the average country has 14,5 observations (of a possible 15). In particular, Luxembourg affects the results (both as an outlier and with only 10 observations), but removing it from the analysis does not alter the results significantly. This analysis has rather weaker results than earlier research, especially when looking at the tax indicator and the total FDI flows indicator. What does this tell us? It shows the importance of robustness tests, as this FGLS model did not survive the change to OLS PCSE. I am content with showing how model specifications in many ways decide how the substantial results are. By choosing the FGLS model, Gropp and Kostial underestimated their errors and may have overestimated the effects taxes have on FDI. This is even more obvious when looking at the explained variance (R^2) that drops significantly from the first to the second model. However, it is clear that the analysis needs to be expanded to give a sufficient explanation on how corporate taxes might affect the inflows of FDI.

4.3. OLS PCSE – POLITICS INCLUDED

Now, in the proceedings hereon out, I will first introduce a partial table where I include one new variable in each model, in total 6. The first model is the same model as on the last page, and the final model includes all the variables for the analysis. However, I will also include the variable *motorway* and a log-transformed GDP per capita indicator as control variables in every model. The second model adds only the *corruption* variable, while the third model includes all explanatory variables, and they are all made using an OLS PCSE model, as recommended by Beck and Katz (1995; 2001). I use the autoregressive (AR1) option to eliminate autocorrelation by lagging the dependent variable.

I will go through the analysis thoroughly, as follows: First, I will discuss the results in general, before I continue with each indicator. After this is done, I will proceed with robustness tests to see whether we can trust the results, and discuss how the model specifications change the preconditions for the analysis. I will then test the hypotheses to see whether they make it through the tests or not, before concluding in chapter 5. If I claimed that there was not much to say substantially in the last model, there are a lot to say about these. First and foremost, it is obvious that it's not only the input that decides the output, but also what instruments you use to prepare the output.

Table 11 OLS PCSE - stage 1-3. Dependent variable: FDI stocks per GDP

VARIABLES	COEFFICIENTS		
	(1)	(2)	(3)
Tax	-0.121	-0.706	-1.026*
	(-0.28)	(-1.33)	(-2.40)
Growth	-1.377*	-1.461*	-0.767
	(-2.56)	(-2.11)	(-1.20)
Inflation (lagged)	-0.100	-0.119	0.523
	(-0.16)	(-0.17)	(0.76)
Exchange rate	0.016	0.025	-0.055
	(0.47)	(1.45)	(-1.53)
Trade (share of GDP)	0.532*	0.513*	0.538*
	(3.79)	(3.92)	(5.81)
Total FDI	18.60	34.93+	18.40
	(1.11)	(1.78)	(1.00)
GDP per capita (log)	17.84*	12.88+	12.96*
	(3.06)	(1.90)	(2.20)
Motorway per sq.km.		0.350*	0.398*
		(2.38)	(2.65)
Corruption		-0.004	0.150
		(-0.02)	(0.54)
Employment			-0.766
			(-1.05)
Union density			-0.150
			(-1.54)
Constant	-176.4*	-118.7+	-85.54
	(-2.50)	(-1.76)	(-1.27)
R^2	0.353	0.534	0.625
N	303	212	173

t statistics in parentheses
+ $p < 0.10$, * $p < 0.05$

First of all, we can see that the explanatory power of the tax variable grows from the first to the third model, and when including the log-transformed GDP per capita in the analysis, the tax indicator gains significance. A raise in the taxes of one percentage point reduces the stock value of FDI per GDP by 1.026, showing a strong and negative relationship between the variables. Removing the log-transformed GDP per capita makes the tax indicator strongly significant and negative in all three models, and this may explain why earlier research has given a lot of weight to the tax rates in this field of research. However, the log-transformed GDP per capita indicator has shown to be important in questions of economic behavior, because it accounts for differences in economic development between countries. There is reason to believe that there is a systematic difference between Ireland and Spain on the one hand, and Sweden and Denmark on the other, especially considering the growth of GDP over time.

In model 2, I have included the institutional variables. The infrastructure measure is thought to measure the output of government investments, while *corruption* captures the perceived level of good governance in the countries. The explanatory power of motorways per square kilometer, measuring the importance of infrastructure to FDI, is strong in both model 2 and, as we shall see, in model 3[11]. Specifically, by adding one kilometer of motorway per square kilometer raises the stock value of FDI per GDP by 0.398. This may indicate that using output measures on public expenditure is underestimated in the literature, but I will return to that in the robustness tests. So far, it seems that higher investments in infrastructure in general, and road infrastructure specifically, is good for foreign investors. However, this effect might be exaggerated, as investments in the primary sector are more reliant on good road infrastructure than for instance investments in IT. The findings support the research of Bellak et al. (2008).

[11] This effect is nearly as strong when controlling for population as well, showing the importance of a high activity level in the public sector (regression not shown)

Corruption shows a counter-intuitive result in model 2, as a lower score on the indicator (higher expected corruption) is good for inward FDI. The coefficients are non-significant in both model 2 and 3, and changing the indicator with others from the Worldwide Governance Indicators dataset does not change this. Comparing the findings in model 2 to the bivariate correlations, this is not as expected, and may be an indicator of the sensitivity of model specifications, especially using short time-series as I do. Although the coefficient is positive in model 3, it is still not significant, and is thus difficult to interpret. For now, it seems as if higher corruption may give more FDI to a country, but we will need to test the robustness using different measures. There is a lot of research on the relationship between corruption and investment, and the findings in general do not support the findings in this analysis; corruption is bad for business. Therefore it is important to remember that the variation on the variable is not necessarily large enough to foster robust results, as later analyses in the thesis also will show (Skog, 2010, p. 91). If I had included countries with more corruption, e.g. Sub-Saharan countries in Africa or South American countries, we might have seen a different outcome.

In model 3, I include the industrial variables *employment* and *union density,* intended to capture the situation on the labor market. None of the indicators are significant, thus difficult to interpret. However, the indicators of GDP per capita and infrastructure are still significant, showing that government growth and investments in infrastructure is positive for investments in the countries. As well, the effect of taxes is significant in this model, and this gives us a point of direction. So far, it seems that *both* tax levels *and* government activities play a part for attracting investments.

I have no reason to claim that Gropp and Kostial were wrong in their analysis, as the relationship between tax rates and FDI still is present in my analysis. However, it seems that institutions do in fact matter, even though I have not (so far) been able to prove that they matter *more*. This becomes also clearer when looking at the one indicator for public goods, motorway per square kilometer, measuring the kilometers of motorway in each country, relative to the country size. The indicator is strong,

positive and significant at the 0,05% level. In the robustness tests, it will be interesting to see whether this holds up even when including other indicators of public goods.

4.4. Robustness

Model specifications determine (to a large degree) the outcome of the analysis, especially in analyses with short time-series. A weakness in political science in general, and quantitative research specifically, is that scholars seldom challenge their models using different methods of robustness tests. Therefore, I want to do robustness tests in two ways; First, I will run a Fixed Effects analysis to control for exogenous shocks. If the financial crisis struck all the EU member states in a similar way, OLS PCSE and FGLS RE may not capture that phenomenon, because they look at variation within states more than between states, as FE models can. Therefore, if the results change in a substantial way using FE models, there is reason to believe that I cannot make conclusions based on my data material, as FE models should at least have t>20. In 4.3.2 I will challenge my analysis using different indicators thought to capture some of the same phenomena. I will include data on average (arithmetic) wages, input and output data on governmental spending on education, and use the Transparency International corruption scores instead of the WGI corruption indicator. If the results change in a substantial way, there is trouble in the analysis, and we cannot make strong conclusions based on the findings. Therefore, it is significant to test the data on model and input specifications.

4.4.1. Fixed Effects

The next table (table 12, p. 68) gives us two new columns of data. The input is the same, but I have used two different models in this analysis. The first column is the same as model 3 in the last table, the complete OLS PCSE (AR1) model. The second column is a Fixed Effects FGLS model. There are not a lot of changes in the models; the only substantial change is that *employment* is statistically significant at the 0,01% level. Although I have explained why Fixed Effects can be a bad idea when using short time-series, it can work as a robustness test because it can control for the financial crisis and the Euro crisis, exogenous shocks that can affect all countries at the same time. As well, it reduces the risk of omitted variable bias, and may give robust results that at the same time remain conservative (Beck & Katz, 1996).

As we can see, the conclusions from the OLS PCSE models have survived the robustness test so far. Using FGLS FE does not change the coefficients in a drastic way, and this increases the robustness of the analysis. It is interesting, though, that the infrastructure indicator loses significance in the FE model, but the impact of the GDP per capita indicator is higher than in the OLS PCSE model. However, I am not satisfied with this. As the infrastructure variable is so strong in all the analyses, I want to include more variables measuring the output of governmental spending on goods regarded as important for investors investing in the country. I will therefore do a new OLS PCSE analysis using different measures.

Table 12 Robustness test 1. Dependent variable: FDI stocks per GDP

VARIABLES	COEFFICIENTS	
	OLS PCSE (AR1)	FGLS FE
Tax	-1.026*	-0.920*
	(-2.40)	(-2.16)
Growth	-0.767	-0.540
	(-1.20)	(-1.34)
Inflation (lagged)	0.523	0.283
	(0.76)	(0.45)
Exchange rate	-0.055	0.119
	(-1.53)	(0.88)
Trade (share of GDP)	0.538*	0.229+
	(5.81)	(1.68)
Total FDI (in and out)	18.40	29.16*
	(1.00)	(2.86)
GDP per capita (log)	12.96*	25.61*
	(2.20)	(2.36)
Motorway per sq.km.	0.398*	0.436
	(2.65)	(0.76)
Corruption	0.150	0.075
	(0.54)	(0.19)
Employment	-0.766	-0.631
	(-1.05)	(-0.52)
Union density	-0.150	0.132
	(-1.54)	(0.19)
Constant	-85.54	-192.1
	(-1.27)	(-1.46)
R^2	0.625	0.638
N	173	173

t statistics in parentheses
+ $p < 0.10$, * $p < 0.05$

4.4.2. CHANGING THE INDICATORS

In this section, I present a new table with 5 columns of interest (in table 13). The first model (3) in the table is the complete OLS PCSE analysis, using annual FDI stock level data per GDP as the dependent variable. In model 4, I include *wages*, which captures the annual average wages in the units, measured in 2012 US Dollars PPPs and constant prices (gathered from the OECD statistics database), so that the numbers are comparable from year to year. The indicator is thought to capture the cost of labor in the country, and a positive coefficient could mean that the quality of labor, as a proxy for quality of institutions, is important for investors. Looking at model 5, we can see that the variables *corruption*, *employment*, and *union density* are switched out with public money spent on education, and the number of students finishing tertiary education, measuring both the input and output of governmental spending on education. The former captures the total public expenditure on education as a percentage of GDP, for all levels of education. The measure is taken from the Eurostat, and is gathered for most of the EU member states. Data from Belgium and Luxembourg is to a large degree missing however, mostly because of a lack of universities in the beginning of the period. If more people in the country have finished a tertiary education, and higher government spending on education has positive coefficients, we can expect that good governance is important for investors. In model 6 I include the corruption index from Transparency International, a rank from 1 to 10 where high values indicates low perceived corruption. As the corruption data in model 3, these are perceptions of corruption in the countries, and is therefore not an objective measure, but subjective. Ideally, you would want objective data, because it would give a better comparative measure, but this is hard to gather when it comes to quality of institutions and corruption. This raises some validity question related to the comparability in the data, and demands a careful interpretation of the results.

The table is presented on the next page, and I will proceed by discussing each model. At a glance, we can see that the infrastructure indicator survives all the model specifications, together with growth and trade. GDP per capita loses importance in the last model, and the tax indicator is not significant in any of the alternative models.

Table 13 Robustness test 2. Dependent variable: FDI stocks per GDP

VARIABLES	COEFFICIENTS				
	(3)	(4)	(5)	(6)	(7)
Tax	-1.026*	-0.830	-0.468	-0.636	-0.424
	(-2.40)	(-1.50)	(-1.03)	(-1.21)	(-0.89)
Growth	-0.767	-1.270*	-1.114*	-1.391*	-0.966*
	(-1.20)	(-2.08)	(-2.51)	(-2.25)	(-2.38)
Inflation (lagged)	0.523	-0.138	-0.116	-0.0531	0.021
	(0.76)	(-0.24)	(-0.24)	(-0.09)	(0.04)
Exchange rate	-0.055	0.0336	0.030	0.0369	0.0322
	(-1.53)	(1.16)	(1.01)	(1.42)	(1.05)
Trade (share of GDP)	0.538*	0.456*	0.506*	0.476*	0.516*
	(5.81)	(2.93)	(6.37)	(3.37)	(6.24)
Total FDI (in and out)	18.40	29.86+	6.740	32.65+	7.902
	(1.00)	(1.77)	(0.48)	(1.90)	(0.56)
GDP per capita (log)	12.96*	-2.809	10.53*	18.10*	4.027
	(2.20)	(-0.26)	(2.18)	(2.24)	(0.36)
Motorway per sq.km.[12]	0.398*	0.455*	0.492*	0.490*	0.374*
	(2.65)	(2.17)	(3.06)	(2.63)	(2.16)
Corruption	0.150				
	(0.54)				
Employment	-0.766				
	(-1.05)				
Union Density	-0.150				
	(-1.54)				
Wages		0.001			0.001+
		(1.62)			(1.65)
Education (spent)			1.971		3.304
			(0.81)		(1.12)
Education (students)			0.001		0.001
			(0.50)		(0.66)
Corruption (TI)				-3.023	-3.907+
				(-1.53)	(-1.73)
Constant	-85.54	7.045	-118.5*	-149.7+	-71.31
	(-1.27)	(0.07)	(-2.20)	(-1.80)	(-0.70)
R^2	0.625	0.429	0.543	0.472	0.558
N	173	243	223	247	221

t statistics in parentheses
+ $p < 0.10$, * $p < 0.05$

[12] I have done the analysis with Internet users as a different measure of infrastructure, this did not change the picture.

By including wages in the second model (4), taxes quickly lose its importance, together with the economical indicator of GDP per capita. Although the average level of wages is not significant in this model, it goes to show that small changes in the input side of a statistical analysis can change the interpretation a lot. In model 5 I include the measures on education, with mostly the same consequences as model 4, although GDP per capita is significant again. Again, none of the education indicators are significant, and this makes it hard to interpret. In model 6, I include a new indicator on corruption, this time from Transparency International. As the WGI indicators, this is a subjective measure, using survey data on European countries. The indicator is strong and significant; showing again that a high level of corruption indicates higher investments in the country (at least measured by GDP). Model 7 is a new complete model (like model 3), this time with all the alternative measures. The tax indicator is not significant, as is not the indicator of economic growth, GDP per capita. However, we can see that the wage indicator is significant on a 0,1% level, showing that investments are higher in countries with higher average wage levels, although the effect might not be too strong. Interestingly, the corruption indicator is strong and negative, even when controlling for education and wage levels. If true, this is somewhat of a breakthrough in the research on FDI. However, I suspect that the short time period, mixed with the possibility of omitted variable bias and endogeneity issues, gives us several reasons to put doubts on that specific result. Also, the other models give no such reason to expect the relationship to be negative and significant, adding further reasons for suspicion. R-squared does not change a lot in this test.

In sum, the data has survived the robustness tests to some degree, although the level of significance varies from model to model. I have tried to show that institutions do matter, and even if I have not been able to prove how much they matter, it seems clear that good governance and the quality of institutions should be included when looking at how taxes affect inward FDI. It is hard to look past the fact that companies paying taxes provide governments with revenues they can use on goods regarded as important for investors, lowering the importance of the tax rates, in line with the research of Acemoglu (2000) and others.

4.5. How Do the hypotheses fare?

In chapter 3, I made some hypotheses based on the theories outlined in chapter 2 and earlier research. How do these hypotheses hold out when faced with the statistical analysis? The first two hypotheses were related to the relationship between taxes and FDI. As the OLS PCSE analysis has shown, there is only some support for the first hypothesis, as the relationship in the complete model is significant and negative. The effect is not confirmed through the robustness tests, so there is reason to question the conclusion. I will therefore be careful to make a clear conclusion based on my empirical analyses, but it is interesting to see that the effect might not be as clear cut as earlier research has shown, especially when considering that my thesis has a longer time range than many other analyses. It could mean that the effect of tax rates is, at least to a certain extent, overrated. To be able to confirm the second hypothesis, that the effect of taxes is reduced when controlling for institutional indicators, I need significant results for the tax indicator in all models. Since the tax indicator is not clear until I include institutional indicators in model 3, this is difficult, and I cannot give full support for the hypothesis, although it might be that the effect of infrastructure and economic growth is so clear that taxes do not matter anymore. Because of the sensitivity of the model, I will not make that claim. What we can say is that indicators measuring infrastructure, economic growth and wages, are positive and significant. Therefore, it seems as if good governance does matter, even if it does not matter *more* than tax rates.

There is strong support for the third hypothesis; the relationship between motorways and FDI is strong, positive and significant through all the stages in the OLS PCSE analysis. I will not put too much emphasis on the FE model in the robustness tests, because of reasons earlier elaborated. Thus, there is support for the claims made by Bellak et al. in that a reduction of transportation costs is important for the inflows of FDI, and that a good infrastructure system is important for the attractiveness of the countries in the analysis. This effect gains in strength when thinking of the integrated market in the EU, as countries without good infrastructure can easily be overlooked when investors decide where to establish themselves. Because the effect is stable and

significant in nearly all the models, there might be reason to question the robustness in the analysis. There might be a spurious effect in the analysis, not controlling for underlying variables affecting both infrastructure and the levels of FDI. I will return to this problem in the next chapter.

Turning to the institutional and the industrial variables, the findings are substantially interesting, even if they are not revolutionary. First of all, none of the institutional or industrial indicators are significant in the main model (3). The closest is the density of labor unions, but this should only have a minor effect, even if it is a negative one. However, when we control for wages in the final model (7) of the robustness tests, we get ambiguous results. Even if more roads, better economic growth and higher wages are positive for the attractiveness of a country, they are outcompeted by the corruption coefficient, claiming that countries with higher levels of corruption are more attractive for investments than others. While this may be true in some sectors, as textile industries in East Asian countries where investors might go for low labor costs before looking at the level of corruption, I believe that this coefficient is troublesome, and should not be trusted. The theoretical expectations would be that good governance in the EU member states is important, but my analysis claims the opposite.
Although it may be that weak states in fact do have more FDI, this is not likely, especially when looking at most of the earlier work on the subject. We might therefore expect the results to not be as robust as we want them to be. This argument is further strengthened when looking at the industrial variables on employment and union density, both of which lack significant explanatory power. As such, it is difficult to claim support for H5, on the relationship between good governance and FDI. I will still claim that the relationship is present, even if the statistical models are not unitary in their findings, because of infrastructure, wages and economic growth being significant and positive.

I cannot claim support for H6, on the relationship between union density and FDI, and H7, on the relationship between employment levels and FDI, as they are not significant in any model. They are also the indicators with the least observations, respectively 276 and 251. The data is, as I have written earlier, difficult in some countries, as they do not necessarily have universities, or they have only recently gotten them, something that undermines the data[13].

The general point to make in this section is that hypotheses are judged as confirmed or denied on the basis of significance in the analysis. Small changes in the model specifications can alter the results in a substantial way, and I therefore want to point out that the analyses made in this thesis are not meaningless even though there is a lack of significant findings. On the contrary, it shows that when challenging your own data, correlations that seem to be significant and substantial, may not be so after all. Therefore, I will continue with discussing the challenges in the data and how the field of research can continue, based on the analyses made in this thesis. I have pursued a balanced dataset, something that reduced the time period of the analysis, and since the effective average tax rate is only available from 1998-2012, this has limited the period of analysis. I could have changed this and used the statutory tax rates, giving me extra years. Even if this could have given me more significant results, it would not have happened without making compromises, as we can question the efficiency of the statutory tax rate measure, considering the exemptions and other schemes reducing the effective tax rate.

[13] Luxembourg got their first university, University of Luxembourg, in 2003.

5. DOWN THE ROAD

We have seen how the statistical analyses have fared, and also how the estimates changes when met with different model specifications and different input. By and large, there seems to be a lot of insecurity in the data, making it hard to conclude. In this section I will first discuss the challenges in the data and how these challenges can be met, before I discuss where the research on institutions, taxes, and FDI can continue. There is a need for economists and political scientists to collaborate more on this subject in the future.

5.1. CHALLENGES TO THE DATA

There are several potential sources of error in the analysis. The first and most important is the short time period analyzed. Ideally, you want longer time periods when using panel data, so that you make sure you do not only look at a period that may be peculiar for some reason. In particular, when looking at EU member states, the ideal measure would be an analysis spanning from the Coal and Steel Community from 1952 and to today, but this is (of course) not possible with the data available. Most of the analyses looking at FDI use even shorter time periods than this thesis, but insofar that we are looking for robust and significant results, this source of error cannot be underestimated, and gives us reason to be extra careful in terms of model sensitivity. The robustness tests have, however, given us reason to believe that the data are more robust than maybe feared, and that we, at least to a certain extent, can rely on the validity in the data. It is interesting to see the short time periods analyzed in the literature; Bénassy-Quéré et al used 1984-2000, Gropp and Kostial used 1988-1997, and Devereux and Griffith used 1980-1994, and many more use even shorter time periods, some down to just 2 years. This is a methodological challenge that should not be underestimated, especially for students using the findings as facts in their own analyses. How do we solve this? There is a need for the EU and their member states to gather annual data on a lot of the action going around in the Union, so that scholars can use their statistical methods in a satisfying way. Quite paradoxically, we might need more public spending from the governments to prove that good governance has an effect on their attractiveness.

The second area of potential error in the thesis is omitted variable bias. There is reason to believe, as the OLI paradigm shows, that investors act in a way where many elements work together when deciding where to invest. The concept of institutions and good governance is not easy to operationalize, and Blonigen (2005) has shown that most of the scholars use expert surveys as I have done in my thesis. Using FE models might handle this, but then we would have a need for longer time series in the data. An example of the problems connected with omitted variable bias is measures on good governance. The infrastructure indicator was clearly significant in most analyses, and while this might mean that the effect is present, it might also be an indicator of weak robustness. Good governance can be difficult to measure objectively, but the problem would be smaller if there were different measures capturing the phenomenon. My experience is that there is so much multicollinearity across the material that using more than one of the subjective measures on good governance reduces the impact of the analysis. The development of objective measures of good governance is decisive for determining the importance of good governance. Some scholars have found a clear relationship between institutions and FDI (see Wei, 2000), but there is a problem connected to the lack of objective data.

There is also the question of clusters. They represent the agglomeration of enterprises close to each other, and are often preferred because it gives enterprises the possibility of sharing ideas and competence, in addition to creating good technical environments. Many enterprises may prefer to be located in a given cluster, even though the tax level in the country is higher than others. Therefore, they are not interested in the country *per se*, but in the locality of the given cluster, for instance IT clusters in Ireland or energy clusters in Germany. I have not been able to capture this with my data, although research environments such as The European Cluster Observatory in Stockholm provide, but the data is sector-oriented, making it more difficult to use in a cross-sectorial analysis such as mine. If you can control for the effects of clusters, the effect of high tax rates might be reduced, at least in less labor-intensive and more high-technological industries where the availability of competent labor force may be of higher importance.

5.2. WHERE DO WE GO FROM HERE?

In the next table we see the summary of hypotheses and how they faced the empirical analyses. Most of the hypotheses are not rejected because the correlation is clearly opposite of my original thoughts, but there is a lack of explanatory power in the data to confirm them. This supports the need to build more data both across countries and time to make it easier to research these subjects.

Table 14 Summary of hypotheses

Hypothesis	Support
H1: tax	Partly
H2: tax versus institutions	No
H3: infrastructure	Yes
H4: tax versus infrastructure	No
H5: good governance	Partly
H6: union density	No
H7: employment	No
H8: education	No

Sometimes it is important to ask the question: so what? In what way does this matter, and what should come after this? In this section of the thesis, I want to go through the implications of the findings in the empirical section, and where the research on how good governance and tax policy affects FDI should go. I will discuss this in two parts: the first methodologically, the second more substantially. I want to give three recommendations for the future research on this subject.

The need for methodological discussion in research papers is there, and the sigh from Beck and Katz (1995), Scruggs (2007) and others, is needed in the research literature. Too many scholars fail to challenge their own data and use different model specifications – some even fail to present their model, so that we have to guess whether there is a 2SLS or a FGLS model. This goes against the goal of the social sciences of public procedures for the possibility of replicating the findings (Keohane, Verba, & King, 1994, p. 8). It is important that we challenge our data, so that we can reach the goal of robustness and inferences. If the social sciences cannot make inferences, there might not be such a big need for us. If we are to continue to use short time-series for our analyses, we have to be able to explain why we use the models we

use, as the data is sensitive and vulnerable to changes, and I would recommend more scholars to follow Beck and Katz's OLS PCSE models, even if they reduce the chance of making inferences. It can seem as if too many scholars give priority to the goal of inference before the goal of reproducability and publicness to the data, and my first recommendation is therefore to be more open when it comes to modelling and choices the scholars make.

5.2.1. WHAT ARE WE MEASURING – FDI DATA SOURCES

I chose to use annual inward FDI stock level data, measured at country level. Many other scholars have used bilateral flows of FDI, some use company-level data, and some have chosen outward more than inward data. Firm-level data has the privilege of digging deeper into the material and seeing more specifically the strategic considerations made by the enterprises, and some have found signs on corporate tax rates playing a part in their considerations on investing abroad (Buettner & Ruf, 2007). While Buettner and Ruf used bilateral FDI flows on firm level, others have used bilateral flows or simply in (out) flows from countries (see Gropp and Kostial 2000; Bellak and Leibrecht 2005). While the different measures are all interesting, they measure different phenomena. When using firm-level data, you measure the strategic considerations of the firm, but when you use aggregated data on country-level, you measure how the tax rates impact the national flows of FDI, which might not be the same concept. This needs to be elaborated in the future, so that we are certain of what we are looking at.

Up until this point, I have only barely touched upon sectorial differences and how the importance of taxes is relative to these differences. The resource-seeking MNEs are more likely to be less dependent on low taxes than for instance IT companies that can easily move between borders. Also, investments in natural resources are more capital-intensive than other forms of investments, which could lead to differences in tax sensitivity. Earlier research has shown that this is the case, in particular in the secondary and tertiary sectors (Stöwhase, 2005)[14]. This makes it difficult to follow up

[14] However, the analysis was done with only 96 observations, with a model underestimating the errors.

Dunning's all-encompassing paradigm in statistical analyses, and maybe Rajneesh Narula was right when claiming that we should take a step back and use the basics of the OLI paradigm when analyzing MNE activity (Narula, 2010). There might be a need to rather make sector-specific analyses that prioritizes more sector-specific indicators. Car manufacturers and IT companies have completely different needs, and this might not come through using country-level data. This also has consequences for the independent variables, as the IT company might need better broadband and more internet users, while the car manufacturer will be interested in better infrastructure and people wanting to buy their cars.

Recognizing the differences between the investor's interests in one sector rather than another will be crucial for the development of this field of research. I claim that the service sector is more tax-sensitive than industries in the primary sector, although this is hardly a controversial claim, as Stöwhase has shown. In his analysis of bilateral flows of FDI, he saw that for instance the mining and agricultural sectors were not particularly tax-sensitive, at least not compared to the tertiary sector (Stöwhase, 2005, p. 556)

Also, there may be an effect that has not been touched upon in this thesis. The Single Market may be the one most important factor in the locational decision-making by the investors. No matter where an enterprise is located in the EU, it automatically gains access to the entire Single Market, an effect that should not be underestimated. In fact, access to the Single Market may be more important than any national regimes, so that the discussion on locational decision-making in the EU loses importance. I do still believe otherwise, especially in some sectors, but there should be no doubt that the Single Market may be the reason for establishment *in* the EU, even if it does not decide *where* in the EU to establish.

5.2.2. DATA ON GOOD GOVERNANCE

Good data on institutional quality and good governance has been hard to come by, and much of the earlier research on the field has failed to show a correlation between for instance corruption and inward FDI (Wei, 2000, p. 1). There is an ongoing discussion on whether subjective or objective measures are the best to use, and one could question if there is such a thing as *objective* good governance. I chose to use subjective measures on corruption in addition to output measures on infrastructure and economic growth, as many has done before me, but there seems to be a need for better data on good governance. The subjective measures in the WGI database that I, and many other scholars, have used are highly correlated; they are also highly correlated with other similar measures such as the corruption measure from Transparency International. This makes the research difficult, especially when scholars fail to include the model specifications as well, so that we do not know how troublesome the possible multicollinearity is. Other scholars have done as me, and used other measures as proxies for government performance (see Globerman and Shapiro, 2002), but this is not necessarily the way to go, as corrupt countries can build new and large motorways and have many Internet users. In addition, the corruption levels in the member states in the European Union are in general low, so that it is not necessarily easy to see the differences.

What are high quality institutions? Structures that support business might downplay other important aspects such as labor protection and other measures that can be a part of the concept of good governance. It seems clear to me that institutional qualities that are good for business are the most important measures in this regard, and there is a need to develop a better framework for measuring and capturing the phenomenon of good governance. One of the most important reasons for this is that there is a lot of information in the qualitative social sciences that can contribute to expand the existing empirical literature in not only quantitative social sciences, but also economics, and it represents an important bridge between the branches of science.

5.2.3. IMPLICATIONS FOR THE DEVELOPMENT OF TRANSFER PRICING POLICIES IN THE EU

Transfer pricing is a large issue connected to the reliability of the FDI data. I referenced the former French president Sarkozy in the introduction from when Ireland wanted financial support in the aftermath of the financial crisis, and France claimed that Ireland should not get that support without raising their tax rates. When we then see how Facebook, who chose Ireland as the country for their subsidiary, pay £2.9 million in taxes while generating nearly £840 million in revenues, this clearly represents a challenge (Neate, 2012). They do this by moving money from Ireland and other countries to tax havens as the Cayman Islands, clearly with the only goal of reducing their tax base. Suddenly, a big gain has turned into a loss, as Facebook reported an annual loss of £15 million. I will not claim that this is something only Facebook does, as other companies such as Apple, Starbucks and Google have done the same thing with their subsidiaries in Ireland. Gropp and Kostial (2000) looked at the consequences of harmonizing the tax rates across the European Union, but I think that the issues of the difference in tax bases are more important and should be at the forefront of the Commissions work on harmful taxes.

6. CONCLUSION

In this thesis, I have looked at how national tax regimes affect their attractiveness to FDI. More specifically, I have looked at how the expected relationship between taxes and FDI are when you include political and industrial institutions into the analysis. By basing my analysis on the article by Gropp and Kostial (2000), I built on earlier research in the field of international political economy and in the intersection between the social sciences and economy and International Business. My thesis has shown two things; first, that model specification and data sensitivity should not be taken lightly, especially when working with short time-series and relative homogenous units. By using the framework developed by Beck and Katz (1995), I showed how FGLS analyses underrate the standard errors, and that they therefore are overconfident in the correlations in the models. By changing from FGLS to OLS PCSE, the correlation coefficients changed quite dramatically. This underlines the need for scholars to challenge their own data and to use robustness tests to a bigger degree than they might do (or at least show in their analyses). The second point to take out of the thesis is that institutions matter. By including measures on economic growth and infrastructure, I have shown that government performance is important for investors. The fact that I failed to show that good governance, measured using WGI data, is as important as other measures, shows the need for developing a better framework for measuring governance quantitatively. This particular field of research is interesting, as it brings the best of the quantitative social sciences with the lines of research from economy and International Business, and the spillover-effects this might bring forth should not be underestimated.

Appendix

The syntax (do-file) is over 40 pages long, and is too big to be included in the appendix. By sending an e-mail to kris.hanssen@gmail.com, I can provide the syntax and dataset.

Table 15 Annual corporate tax revenue per GDP (OECD, 2013b)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Austria	2,127	1,773	1,994	3,043	2,191	2,155	2,249	2,21	2,172	2,417	2,459	1,695	1,935	2,22	2,28
Belgium	3,374	3,224	3,203	3,114	3,031	2,865	3,087	3,305	3,529	3,487	3,34	2,435	2,629	2,9	3,104
Czech Republic	3,272	3,697	3,356	3,855	4,157	4,44	4,411	4,352	4,605	4,695	4,231	3,547	3,383	3,393	3,558
Denmark	3,004	2,375	3,258	2,786	2,872	2,903	3,161	3,922	4,343	3,782	3,288	2,325	2,763	2,765	3,033
Estonia	2,431	1,95	0,887	0,686	1,108	1,581	1,664	1,427	1,491	1,624	1,64	1,835	1,348	1,24	1,449
Finland	4,325	4,33	5,895	4,189	4,169	3,403	3,518	3,334	3,387	3,871	3,485	2,028	2,551	2,731	2,188
France	2,644	2,957	3,07	3,372	2,876	2,492	2,772	2,425	2,982	2,981	2,932	1,468	2,135	2,52	2,547
Germany	1,591	1,781	1,811	0,603	1,019	1,269	1,554	1,797	2,183	2,254	1,961	1,396	1,568	1,749	1,811
Greece	2,823	3,175	4,172	3,399	3,412	2,936	3,026	3,316	2,727	2,556	2,519	2,462	2,451	2,099	..
Hungary	2,114	2,293	2,236	2,33	2,316	2,208	2,171	2,115	2,344	2,804	2,637	2,26	1,239	1,214	1,302
Ireland	3,322	3,796	3,673	3,523	3,671	3,661	3,552	3,375	3,761	3,387	2,835	2,412	2,52	2,481	2,577
Italy	2,913	3,254	2,896	3,487	3,098	2,758	2,805	2,78	3,397	3,793	3,696	3,094	2,824	2,709	2,864
Luxembourg	7,64	6,68	6,969	7,313	8,031	7,328	5,725	5,79	4,955	5,272	5,36	5,76	5,79	5,04	5,081
Netherlands	4,221	4,053	4,004	3,926	3,309	2,808	3,053	3,77	3,315	3,245	3,165	2,024	2,178	2,071	..
Poland	2,59	2,411	2,429	1,87	2,045	1,803	2,22	2,483	2,397	2,752	2,709	2,29	1,994	2,077	..
Portugal	3,05	3,49	3,726	3,257	3,302	2,78	2,866	2,678	2,925	3,587	3,655	2,859	2,841	3,222	2,792
Slovak Republic	3,238	3,1	2,608	2,593	2,516	2,753	2,595	2,726	2,907	2,987	3,123	2,511	2,519	2,411	2,477
Slovenia	0,993	1,157	1,162	1,257	1,564	1,735	1,925	2,766	2,963	3,227	2,506	1,841	1,882	1,69	1,263
Spain	2,411	2,741	3,06	2,82	3,191	3,074	3,395	3,856	4,138	4,672	2,826	2,236	1,776	1,819	2,173
Sweden	2,749	2,943	3,92	2,851	2,285	2,425	3,017	3,683	3,643	3,708	2,984	2,996	3,47	3,23	3,025
United Kingdom	3,869	3,536	3,518	3,443	2,84	2,71	2,841	3,309	3,919	3,378	3,57	2,76	3,052	3,079	2,87

Table 16 Statutory tax rates (OECD, 2013b)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%
Belgium	40,2%	40,2%	40,2%	40,2%	40,2%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%	34,0%
Czech Republic	35,0%	35,0%	31,0%	31,0%	31,0%	31,0%	28,0%	26,0%	24,0%	24,0%	21,0%	20,0%	19,0%	19,0%	19,0%	19,0%
Denmark	34,0%	32,0%	32,0%	30,0%	30,0%	30,0%	30,0%	28,0%	28,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%
Estonia			26,0%	26,0%	26,0%	26,0%	26,0%	24,0%	23,0%	22,0%	21,0%	21,0%	21,0%	21,0%	21,0%	21,0%
Finland	28,0%	28,0%	29,0%	29,0%	29,0%	29,0%	29,0%	26,0%	26,0%	26,0%	26,0%	26,0%	26,0%	26,0%	24,5%	24,5%
France	41,7%	40,0%	37,8%	36,4%	35,4%	35,4%	35,4%	35,0%	34,4%	34,4%	34,4%	34,4%	34,4%	34,4%	34,4%	34,4%
Germany	56,0%	52,0%	52,0%	38,9%	38,9%	40,2%	38,9%	38,9%	38,9%	38,9%	30,2%	30,2%	30,2%	30,2%	30,2%	30,2%
Greece	40,0%	40,0%	40,0%	37,5%	35,0%	35,0%	35,0%	32,0%	29,0%	25,0%	25,0%	25,0%	24,0%	20,0%	20,0%	26,0%
Hungary	18,0%	18,0%	18,0%	18,0%	18,0%	18,0%	16,0%	16,0%	17,3%	20,0%	20,0%	20,0%	19,0%	19,0%	19,0%	19,0%
Ireland	32,0%	28,0%	24,0%	20,0%	16,0%	12,5%	12,5%	12,5%	12,5%	12,5%	12,5%	12,5%	12,5%	12,5%	12,5%	12,5%
Italy	37,0%	37,0%	37,0%	36,0%	36,0%	34,0%	33,0%	33,0%	33,0%	33,0%	27,5%	27,5%	27,5%	27,5%	27,5%	27,5%
Luxembourg			37,5%	37,5%	30,4%	30,4%	30,4%	30,4%	29,6%	29,6%	29,6%	28,6%	28,6%	28,8%	28,8%	29,2%
Netherlands	35,0%	35,0%	35,0%	35,0%	34,5%	34,5%	34,5%	31,5%	29,6%	25,5%	25,5%	25,5%	25,5%	25,0%	25,0%	25,0%
Poland	36,0%	34,0%	30,0%	28,0%	28,0%	27,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%
Portugal	37,4%	37,4%	35,2%	35,2%	33,0%	33,0%	27,5%	27,5%	27,5%	26,5%	26,5%	26,5%	26,5%	26,5%	31,5%	31,5%
Slovak Republic	40,0%	40,0%	29,0%	29,0%	25,0%	25,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	23,0%
Slovenia			25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	23,0%	22,0%	21,0%	20,0%	20,0%	20,0%	17,0%
Spain	35,0%	35,0%	35,0%	35,0%	35,0%	35,0%	35,0%	35,0%	35,0%	32,5%	30,0%	30,0%	30,0%	30,0%	30,0%	30,0%
Sweden	28,0%	28,0%	28,0%	28,0%	28,0%	28,0%	28,0%	28,0%	28,0%	28,0%	28,0%	26,3%	26,3%	26,3%	26,3%	22,0%
United Kingdom	31,0%	30,0%	30,0%	30,0%	30,0%	30,0%	30,0%	30,0%	30,0%	30,0%	28,0%	28,0%	28,0%	26,0%	24,0%	23,0%

Table 17 Tax revenues as a percentage of total taxation (OECD, 2013b)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Austria	4,822	4,053	4,633	6,778	5,021	4,956	5,224	5,247	5,229	5,785	5,753	3,994	4,586	5,246	5,281
Belgium	7,497	7,173	7,173	6,977	6,775	6,472	6,953	7,433	8,002	7,996	7,6	5,649	6,038	6,584	6,855
Czech Republic	9,685	10,648	9,873	11,294	11,919	12,397	12,166	12,056	12,921	13,089	12,094	10,507	9,964	9,714	10,022
Denmark	6,094	4,742	6,6	5,748	6,002	6,045	6,447	7,716	8,753	7,734	6,885	4,868	5,826	5,798	6,324
Estonia	7,143	5,993	2,86	2,27	3,572	5,138	5,447	4,657	4,858	5,168	5,149	5,19	3,964	3,84	4,457
Finland	9,351	9,431	12,484	9,361	9,329	7,715	8,093	7,593	7,733	9,01	8,124	4,732	6,001	6,252	4,964
France	5,969	6,549	6,915	7,651	6,608	5,749	6,361	5,499	6,719	6,826	6,738	3,458	4,981	5,718	5,624
Germany	4,356	4,77	4,834	1,66	2,859	3,547	4,438	5,129	6,122	6,245	5,374	3,737	4,335	4,736	4,817
Greece	8,732	9,565	12,15	10,233	10,077	9,087	9,608	10,317	8,624	7,871	7,849	8,074	7,746	6,524	..
Hungary	5,549	5,892	5,694	6,068	6,099	5,823	5,766	5,667	6,286	6,954	6,571	5,67	3,258	3,276	3,346
Ireland	10,629	12,108	11,903	12,218	13,238	13,004	12,001	11,204	11,903	10,884	9,699	8,741	9,205	8,89	9,111
Italy	7,037	7,698	6,897	8,366	7,54	6,64	6,881	6,85	8,073	8,782	8,589	7,132	6,574	6,299	6,448
Luxembourg	19,4	17,449	17,807	18,397	20,428	19,222	15,33	15,407	13,816	14,796	14,357	14,752	15,507	13,624	13,458
Netherlands	10,812	10,115	10,117	10,302	8,837	7,619	8,2	9,814	8,48	8,377	8,067	5,302	5,593	5,372	..
Poland	7,279	6,875	7,416	5,743	6,184	5,536	7,013	7,525	7,053	7,914	7,91	7,214	6,29	6,43	..
Portugal	10,16	11,348	12,078	10,622	10,568	8,838	9,466	8,625	9,211	11,045	11,231	9,311	9,094	9,763	8,597
Slovak Republic	8,815	8,767	7,651	7,833	7,573	8,327	8,193	8,66	9,875	10,134	10,596	8,637	8,904	8,389	8,707
Slovenia	2,642	3,052	3,115	3,352	4,133	4,561	5,048	7,163	7,745	8,568	6,761	4,976	4,937	4,56	3,38
Spain	7,255	8,028	8,92	8,317	9,273	9,028	9,733	10,699	11,211	12,529	8,526	7,229	5,464	5,658	6,612
Sweden	5,42	5,763	7,62	5,774	4,815	5,076	6,278	7,535	7,539	7,831	6,427	6,434	7,64	7,31	6,829
United Kingdom	10,952	9,895	9,668	9,515	8,153	7,87	8,138	9,339	10,805	9,449	9,968	8,077	8,757	8,613	8,142

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